MIDWAY

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16-43725-101-B

MORTAL KOMBAT KIT

Using the T-Unit CPU

OPERATIONS MANUAL

* Installation & Operation
* Testing & Problem Diagnosis
* Parts Information
* Wiring Diagrams & Schematics

Mortal Kombat Instructions

Insert Coin(s)

In a two player game, the loser pays and the winner stays.

Press the Punch and Kick buttons to attack an opponent.

Use the joystick to make the screen player jump or duck, and move left or right.

Use joystick and button combinations to discover secret moves.

Mortal Kombat
Kit
Using the T-Unit CPU

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Mortal Kombat
Kit
Using the T-Unit CPU

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Installation & Operation

Safety Notices

The following safety hints apply to all kit operators and service personnel. Specific warnings and cautions will be found throughout this manual where they apply. We recommend that you read this page, and also all of Section 1, before preparing your kit for play.

⚠ CAUTION

Notice: Salvaged Parts

Parts salvaged from old games are required to complete your kit. These salvaged parts must operate perfectly: otherwise, the converted game cannot perform properly or safely. Always repair circuit board malfunctions and cabinet damage before conversion is attempted.

Notice: Power Supply

Be sure the power supply from your old game is capable of +5V dc at 5A and +12V at 2A. These operating voltages are necessary for your kit. Your power supply must be FCC approved.

Notice: Monitor

This kit is not intended for use with X-Y monitors. Suitable monitors have horizontally mounted CRTs and raster electronics with inputs for red, green and blue video, as well as Composite Negative Sync inputs.

Notice: Coin Mechanism

Be sure to clean and lubricate your old coin mechanisms. Servicing them is crucial to your game's earning potential and operation.

Notice: Coin Meters

Coin meters are not provided with this kit. Wiring information is provided as a convenience to the operator.

Notice: Servicing, Installing

Always turn your game Off and unplug it before attempting to service or install your kit.

ATTENTION !

PROPERLY ATTACH ALL CONNECTORS. *Be sure that the connectors on each printed circuit board (PCB) are properly connected. If they do not slip on easily, do not force them. A reversed connector may damage your kit and void the warranty. All connectors are keyed to fit specific pins on each board.*

CONVERSION PROCEDURES

Inspection

Unpack the materials from the carton and inspect for obvious signs of damage. Use this checklist to be sure your kit is complete.

Part No.	Item	Quantity
[ ] A-14732-43725	Sound board†	1
or A-14732-40025	Sound Board†	
[ ] A-14816-43725	CPU board	1
[ ] A-15652	Volume Control Assembly	1
5014-12925-00	50KΩ Volume Control Pot.	1
[ ] H-13411	Main JAMMA Cable	1
[ ] H-16155	Sound/Power Speaker Cable	1
[ ] H-16561	Adapter Cable for STREET FIGHTER II	1
[ ] H-16562	Auxiliary Cable	1
[ ] 03-8338-1	PCB Mounting Spacers	11
[ ] 16-9383	Controls Template	1
[ ] 16-43725-101	Manual	1
[ ] 20-9687-1	Pushbutton, Red	4
[ ] 20-9687-2	Pushbutton, White	4
[ ] 20-9687-3	Pushbutton, Blue	4
[ ] 20-9694-1	8-way Joystick, Red	2
[ ] 31-1612-43125	Control Panel Overlay	1
[ ] 31-1644-40025-1	Marquee	1
[ ] 31-1714-43125	Card & Controls Decal*	1
[ ] 31-1715	Cabinet Side Decal	2
[ ] 31-1725-1	Coin Door Decal	1
[ ] 31-1725-2	Coin Decal (recommended)	1
[ ] 31-1729	Symbol Decal Pad*	1
[ ] 5795-10937-18	20-pin Ribbon Cable	1
[ ] Assorted Hardware		

† Determine which Sound board sub-assembly this kit contains by looking at the audio amp.
Audio amp HA13116 indicates sub-assembly A-14733
Audio amp MB3731 indicates sub-assembly A-15739

**Choose either the 31-1714-43125 Control Decals or the 31-1729 Symbol decal pad to use on the control panel.*

Recommended Tools and Supplies

[ ] black semi-gloss paint
[ ] electric drill
[ ] electric screwdriver
[ ] grease pencil or marker
[ ] hex driver
[ ] 180 grit sandpaper or electric sander
[ ] pliers
[ ] razor knife
[ ] soldering iron and solder
[ ] wire cutters
[ ] black electrical tape

Converting from a STREET FIGHTER II game cabinet

Cabinet Modifications

1. Remove the old decals and artwork and clean the glue residue. Repaint the cabinet with black semi-gloss paint. Allow paint to dry.

2. Pencil a line roughly at the top of the old graphic. Lightly moisten the cabinet with soapy water. Apply the decal starting at the top and working down. After the decal is in place, smooth it down, taking care to squeeze out the air bubbles. If you miss an air bubble, pop it with a razor blade or a pin and burnish it down. Allow 12 hours for the adhesive in the decals to set. Remove masking.

3. Check the kit for an FCC sticker and apply it over the existing sticker on the cabinet. See NOTICE to the left.

4. Apply the Game Play Instruction Decal to the CRT viewing glass. Be sure the decal does not obstruct the CRT.

NOTICE

When Midway ships a game, it is in compliance with FCC regulations. Your sticker is proof. If the sticker is missing or damaged, legal repercussions to the owner or distributor of the game may result. If your game kit does not contain an FCC sticker, call Midway Manufacturing immediately.

Control Panel Modifications

1. Remove the control panel buttons and joysticks and remove the old vinyl covering and artwork. Tagging the wires as they are removed from the pushbutton and joystick switches will make reinstallation easier.

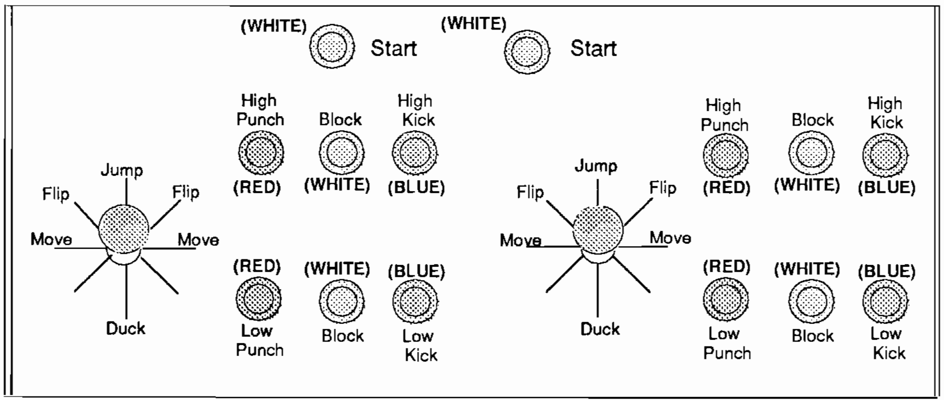
2. Carefully remove the backing on the vinyl control panel overlay. Place the overlay on top of the control panel. Prevent air bubbles from getting under the vinyl overlay.

3. After the overlay is in place, use a razor knife to cut holes for the pushbuttons and joysticks. Position the stickers (or symbol decal) around the appropriate hole locations. See the page 1-5 for sticker locations.

4. Remove the switch from the pushbutton by pulling the large prong away from the switch, then pull the switch off the housing. Unscrew the nut from the housing. Push the switch housing through the control panel from the front. Screw the nut back onto the switch housing from the back of the control panel. Push the switch back into the switch housing.

5. Remove the "E"-ring and slide the shaft and the plastic ring off the joystick base. Be sure that the bushings remain in the base. Screw the base to the underside of the control panel. Slide the plastic ring around the shaft so that the rough side is next to the shaft handle. Slide the shaft through the control panel and base. Replace the "E"-ring.

6. Mount the volume control, using the screws provided, where it is easily accessible. On top of the cash box, or on the wall near the sound board are two possible locations.



Typical control panel layout & sticker locations for modification of a STREET FIGHTER II control panel

PC Board Installation

1. Replace the existing CPU board and sound board with the Mortal Kombat CPU board and sound board.

2. Plug the JAMMA connector into the CPU board at P1. Plug the 10-pin connector of the Adapter cable into the 10-pin JST type connector from the control panel. Be sure to match the wire colors of both connectors. Plug the other end of the Adapter cable into the CPU board at P5.

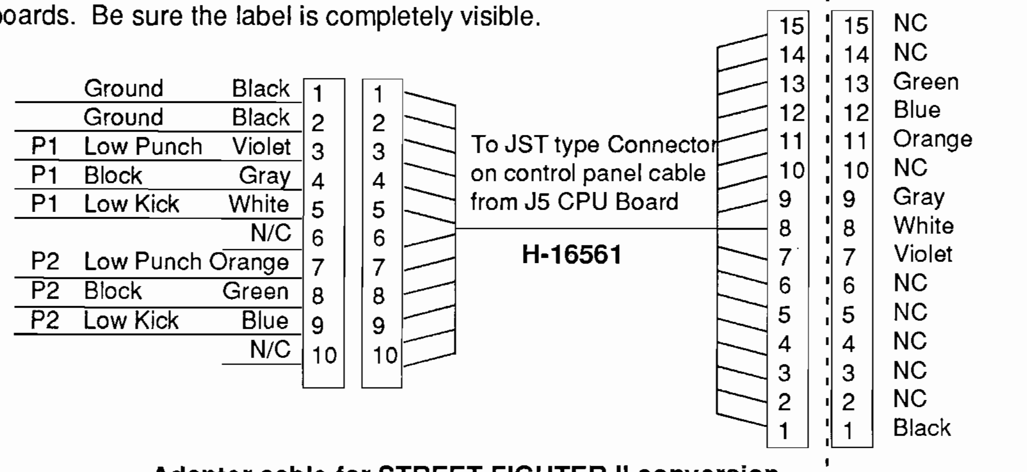
3. Connect the ribbon cable from P1 on the sound board to P12 on the CPU board. Be sure that the red line goes to the same pin on both boards. Connect the wire harness cable from P7 (speaker), and P6 (power), on the sound board to P3 (sound power speaker connector) on the CPU board.

Note

The ribbon cable may need to be twisted in order to connect it properly.

4. Only, P1, P3, P5, and P12 are used on the CPU Board. All other connectors on the CPU are not used.

5. Place the FBI Warning Label on the inside of the cabinet next to the PC boards. Be sure the label is completely visible.



Adapter cable for STREET FIGHTER II conversion

Converting from a typical video game cabinet

Cabinet Modifications

1. Repaint the cabinet with black semi-gloss paint (games with wood grain sides: remove the old decals and artwork and clean the glue residue before painting). Allow paint to dry.

2. Pencil a line roughly at the top of the old graphic. Lightly moisten the cabinet with soapy water. Apply the decal starting at the top and working down. After the decal is in place, smooth it down, taking care to squeeze out the air bubbles. If you miss an air bubble, pop it with a razor blade or a pin and burnish it down. Allow 12 hours for the adhesive in the decals to set. Remove masking.

3. Check the kit for an FCC sticker and apply it over the existing sticker on the cabinet. See <u>NOTICE</u> to the left.

4. Apply the Game Play Instruction Decal to the CRT viewing glass. Be sure the decal does not obstruct the CRT.

<u>NOTICE</u>

When Midway ships a game, it is in compliance with FCC regulations. Your sticker is proof. If the sticker is missing or damaged, legal repercussions to the owner or distributor of the game may result. If your game kit does not contain an FCC sticker, call Midway Manufacturing immediately.

Control Panel Modifications

1. Remove the control panel buttons and joysticks and remove the old vinyl covering and artwork.

2. Use the control panel template to help you design your control panel. You will need to use the template twice. Once for the left player controls and once for the right player controls. Refer to page 1-7 for suggested template layouts.

3. Drill holes as needed for the joysticks and control panel buttons. Plug previous holes with wood blocks, putty, cardboard or epoxy. File the new holes smooth.

4. Carefully remove the backing on the vinyl control panel overlay. Place the overlay on top of the control panel. Prevent air bubbles from getting under the vinyl overlay.

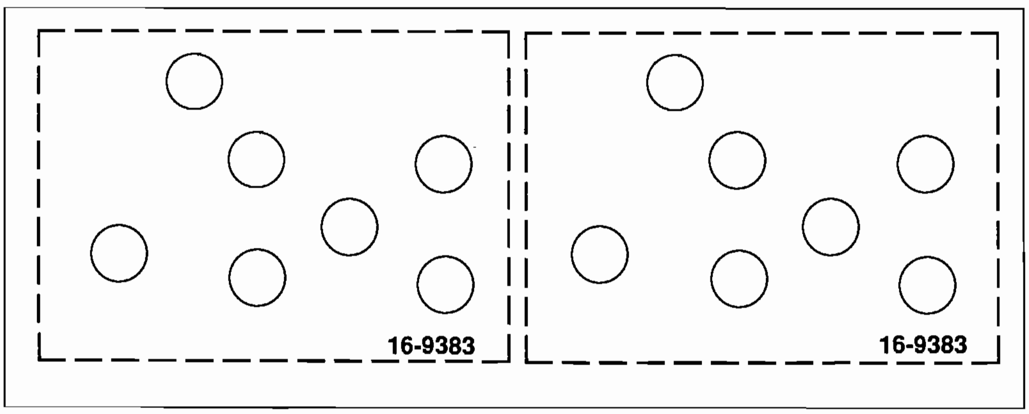
5. a) After the overlay is on securely, use a razor knife to cut holes for the control panel buttons and joysticks.
   b) Position the stickers (or symbol decal) around the appropriate locations. Refer to page 1-7 for suggested control panel button and joystick sticker locations.

6. Remove the switch from the pushbutton by pulling the large prong away from the switch, then pull the switch off the housing. Unscrew the nut from the housing. Push the switch housing through the control panel from the front. Screw the nut back onto the switch housing from the back of the control panel. Push the switch back into the switch housing.

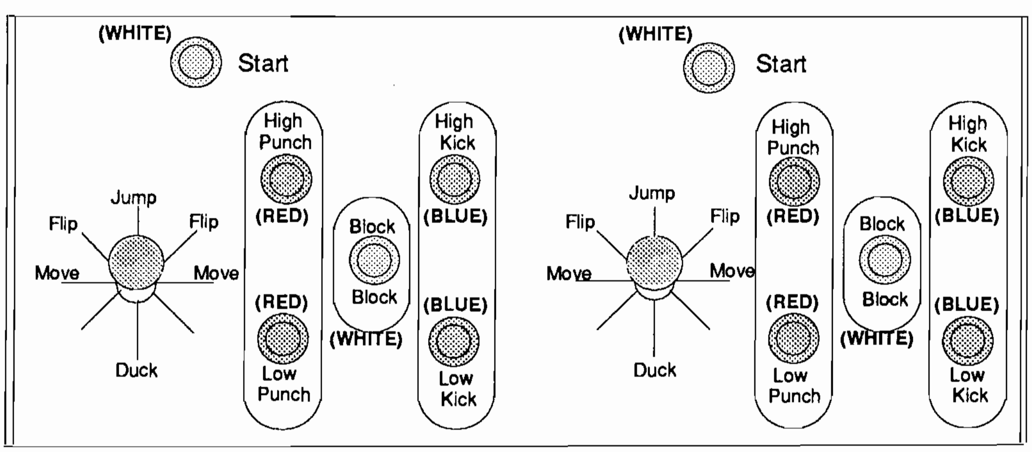
7. Remove the "E"-ring and slide the shaft and the plastic ring off the joystick base. Be sure that the bushings remain in the base. Screw the base to the underside of the control panel. Slide the plastic ring around the shaft so that the rough side is next to the shaft handle. Slide the shaft through the control panel and base. Replace the "E"-ring.

8. Mount the volume control, using the screws provided, where it is easily accessible. On top of the cash box, or on the wall near the sound board are two possible locations.

Suggested Control Panel Template Layout



Suggested control panel layout and sticker locations for a typical video game control panel



Installing the PC boards and wiring into a JAMMA game cabinet

1. Disconnect and remove the existing CPU board and sound board in the JAMMA game cabinet.

2. Mount the CPU board inside the JAMMA game cabinet where the old CPU board was located. Mount the sound board next to the CPU board using the stand-offs and screws provided.

3. If you choose to use the JAMMA cable provided with the kit, disconnect your old JAMMA cable from the speaker, power supply, control panel switches (may already be disconnected) and coin door. Remove the cable from the game. If you are not going to use the JAMMA Cable provided with the kit, check the JAMMA Cable Chart to be sure your cable is compatible. Leave your power supply chassis as is.

4. Connect the JAMMA cable to P1 on the CPU board. Use the Cabinet Wiring Diagram for reference and solder the correct JAMMA cable wires to the speaker. Then, connect the wires to the coin door, power supply and control panel.

   Player 1 has orange-color stripe wires except for Start 1 which has a yellow-green wire. Player 2 has yellow-color stripe wires. Follow the Control Panel Wire Color List on the inside of the back cover or, the Cabinet Wiring Diagram in Section 3 of this book.

5. Connect the Auxiliary cable to P5 of the CPU board. Follow the Cabinet Wiring Diagram or the Control Panel Wire Color List and connect the wires to the switches for the Low Punch and Low Kick buttons for players 1 & 2.

6. Connect the ribbon cable from P1 on the sound board to P12 on the CPU board. Be sure that the red line goes to the same pin on both boards. Connect the wire harness cable from P7 (speaker), and P6 (power), on the sound board to P3 (sound power speaker connector) on the CPU board.

7. Only, P1, P3, P5, and P12 are used on the CPU Board. All other connectors on the CPU are not used.

8. Place the FBI Warning Label on the inside of the cabinet next to the PC boards. Be sure the label is completely visible.

Note

If you choose to use your own JAMMA Cable and not the one provided in the kit, be sure to check the JAMMA Cable Chart to verify that it is compatible.

⚠ CAUTION

Properly insulate any unused wires within the JAMMA cable, especially the gray, gray-green and gray-yellow wires. This is a fully wired JAMMA cable. Many of the wires will not be used for this kit. These wires have been installed so that you can use this cable for future kits

Note

The ribbon cable may need to be twisted in order to connect it properly.

Installing the PC boards and wiring into a NON-JAMMA game cabinet

1. Disconnect and remove the existing CPU board and sound board in the game cabinet.

2. Mount the CPU board inside the game cabinet where the old CPU board was removed. Mount the sound board next to the CPU board using the stand-offs and screws provided.

3. Leaving several inches of wire, cut the wires at the coin door, control panel switches (which may already be disconnected) speaker and power supply. Remove the existing harness from the cabinet. Leave the cable hooks in place.

4. Install the JAMMA cable provided in this kit. Players 1 & 2 , the coin door and the power supply wires are bundled together in individual groups. Insure that the cable is properly dressed and supported.

5. Connect the JAMMA cable to P1 on the CPU board. Use the Cabinet Wiring Diagram for reference and solder the correct JAMMA cable wires to the speaker. Then, connect the wires to the coin door, power supply and control panel.

   Player 1 has orange-color stripe wires except for Start 1 which has a yellow-green wire. Player 2 has yellow-color stripe wires. Follow the Control Panel Wire Color List on the inside of the back cover or, the Cabinet Wiring Diagram in Section 3 of this book.

6. Connect the Auxiliary cable to P5 of the CPU board. Follow the Cabinet Wiring Diagram or the Control Panel Wire Color List and connect the wires to the switches for the Low Punch and Low Kick buttons for players 1 & 2.

7. Connect the ribbon cable from P1 on the sound board to P12 on the CPU board. Be sure that the red line goes to the same pin on both boards. Connect the wire harness cable from P7 (speaker), and P6 (power), on the sound board to P3 (sound power speaker connector) on the CPU board.

8. Only, P1, P3, P5, and P12 are used on the CPU Board. All other connectors on the CPU are not used.

9. Place the FBI Warning Label on the inside of the cabinet next to the PC boards. Be sure the label is completely visible.

Note

Be sure all spliced wires are well insulated with black electrical tape.

⚠ CAUTION

Properly insulate any unused wires within the JAMMA cable, especially the gray, gray-green and gray-yellow wires. This is a fully wired JAMMA cable. Many of the wires will not be used for this kit. These wires have been installed so that you can use this cable for future kits

Note

The ribbon cable may need to be twisted in order to connect it properly.

GAME FEATURES

Note

When an error is detected during Start-up Tests, game start-up does not progress, and an error message appears on the screen.

STARTING UP

Switch on power to the game. A "rug" pattern appears on the CRT screen. When the "rug" pattern ends, the screen shows CHECKING SCRATCH RAMS, and then CHECKING ROMS. The next screen shows MORTAL KOMBAT REVISION LEVEL, CMOS TEST OK and the COIN SETTING. The game then begins the Attract Mode.

Insert the desired amount of coins or tokens. Press the appropriate Start button.

Player Controls

- **Start Buttons**
  Each player has a Start Button which allows him/her to begin or continue play.

- **High Kick/High Punch Buttons**
  Allows the screen player to kick or punch an opponent in the upper body.

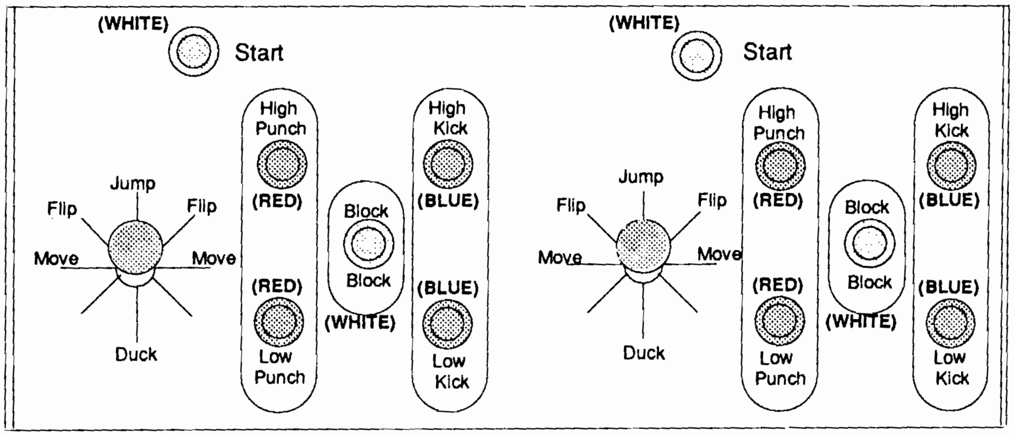
- **Low Kick/Low Punch Buttons**
  Allows the screen player to kick or punch an opponent in the lower body.

- **Block Buttons**
  Allows the screen player to block an opponent's punch, kick or special move.

- **Joystick**
  Allows the screen player to move, flip, jump and duck.

Note

Discover secret moves by using joystick and button combinations.



Control Panel

GAME OPERATION

It is suggested that the MORTAL KOMBAT Control Switches be located inside the coin door. These switches allow the operator to customize some features of the game.

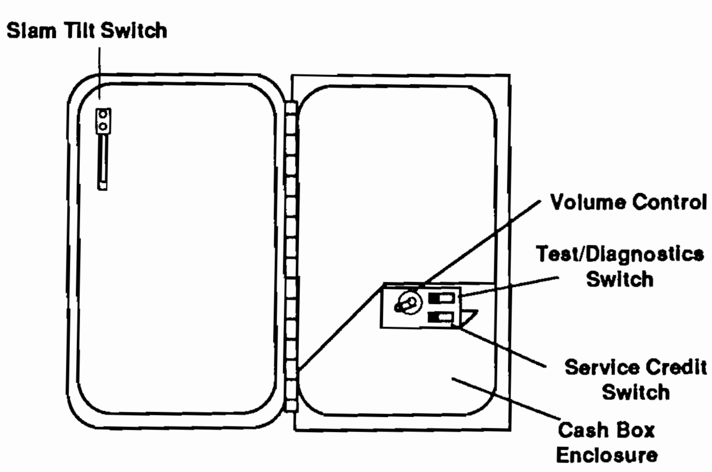
CONTROL SWITCHES

- The **COIN DOOR SLAM TILT SWITCH** detects any forceful vibrations against the Coin Door. This eliminates pounding for free games. (Optional Switch.)

- The **VOLUME CONTROL** allows increasing or decreasing the volume level of the game music and speech. For greater profits, set your game's volume to a nice loud setting.

- The **TEST/DIAGNOSTICS SWITCH** allows you to activate the game's Menu System. Move the Test Switch to access the Main Menu. To exit the Menu System, select EXIT TO GAME OVER from the Main Menu, then press any control panel button. This function is also available on DIP Switch #2 position #8. (Optional Switch.)

- The **SERVICE CREDIT SWITCH** is a special feature switch that allots credit without affecting the game's bookkeeping total. (Optional Switch.)



Typical Control Switch Locations

MENU SYSTEM OPERATION

OPERATION

All MORTAL KOMBAT Game Audits, Adjustments, and Diagnostics are options of the Main Menu. Each option, in turn, has its own menu, listing several choices that you may act upon as desired.

Move the Test Switch (if installed), or close Switch #8 of DIP Switch Bank #2, to activate the Main Menu (shown below). Game adjustments, bookkeeping, and diagnostics are all accessible from this menu.

Move any joystick up or down to cycle through the menu options. Notice that the options are highlighted in sequence. Press any button to activate a highlighted option.
Note: Only highlighted options can be activated.

Select With Any Stick
Activate with Any Button

Diagnostic Tests
Coin Bookkeeping
Game Audits
Game Adjustment
Utilities
Exit Test Menu

Main Menu

DIAGNOSTIC TESTS

To enter the Diagnostic Tests from the Main Menu, move any joystick to select (highlight) the Diagnostic Test option, and press any control panel button to activate the option.

Select With Any Stick Activate With Any Button

Switch Test DIP Switch Test CPU Board Test Sound Board Test Monitor Patterns Burn-in Test Return To Main Menu

Diagnostic Menu

Switch Test

The Switch Test allows the operator to test the switches on the control panel and the coin door.

Select the Switch Test by using any joystick to highlight the Switch Test option; then, press any control panel button to activate it. The top of the screen shows a layout of the control panel and the bottom of the screen lists the coin door switches. Pressing a switch causes the corresponding switch location on the screen to light. Release the switch and the screen returns to normal.

Press the Start buttons together to return to the Diagnostic Menu.

DIP Switch Test

Note

Setting the positions of DIP Switch 1 to Off means there is violence, blood low blows, and attract mode sounds in the game.

The DIP Switch Test allows the operator to check the position of the two 8-position DIP Switches on the CPU Board. The operator can also change the setting of each position of each DIP Switch during this mode.

Use any joystick to select the DIP Switch Test and any control panel button to activate it. The screen displays a layout of their current settings.

To change a DIP Switch setting, press the switch to the desired setting, then check the screen to verify that the switch now shows the new setting.

Press any control panel button to return to the Diagnostic Menu.

DIP Switch 1 Settings Table

	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 7	SW 8
Violence On	Off * On							
Blood In game		Off * On						
Low Blow in game			Off * On					
Attract Sounds On				Off * On				
Disable Comic Book Add (On=Disabled)					Off * On	Off * On	Off * On	Off * On

DIP Switch 2 Settings Table

	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
Coinage DIP Switch CMOS	Off * On							
Coin Settings USA 1 / Ger 1 / Fr 1 USA 2 / Ger 2 / Fr 2 USA 3 / Ger 3 / Fr 3 USA 4 / Ger 4 / Fr 4 USA ECA / Ger ECA / Fr ECA N/U / N/U / N/U N/U / N/U / N/U Free Play / Free Play / Free Play		Off * On Off On Off On Off On	Off * Off On On Off Off On On	Off * Off Off Off On On On On				
Country USA German French Not Used					Off * On Off On	Off * Off On On		
One Counter **Two Counters**							Off * On	
Test Switch Game Mode Test Mode								Off * On

* Indicates Factory Setting

CPU Board Test

The CPU Board Test (much like the Start-up Test) allows the operator to check the RAMs and ROMs.

Select the CPU Board Test with any joystick; then, press any control panel button to activate the automatic test of the CPU Board's RAMs and ROMs. When this test is activated, a "rug"' pattern appears on the screen. The screen then changes to show the layout of the RAMs, and ROMs. A ROM or RAM location that is shown as black with a white outline is used and should turn either red or green. A ROM or RAM location that is shown as gray with a white outline is not used in this game. During the test, ROM or RAMs are good, if they turn green; they are faulty, if they turn red.

The CPU Test pauses when a bad ROM or RAM is detected. Press any button to continue the test.

Sound Board Test

The Sound Test allows listening to some of the sounds that this game is capable of producing. This test also emits a tone for each fault that is detected.

Select the Sound Board Test with any joystick; then, press any control panel button to activate the test. The screen displays two test options:

GENERAL TEST analyzes the sound circuitry. The screen shows a list of error codes. A successful test causes a single "tone" to sound. Detection of a fault causes a series of tones or no tone at all to sound.

PLAY SOUNDS tests synthesized & digitized sounds from the Sound Board. Advance to the next sound by pressing any action button. Press either Start button to repeat a sound.

Select RETURN TO MAIN MENU or BACK TO DIAGNOSTIC MENU. Press any control panel button to activate your selection.

General Test
Play Sounds
Back To Diagnostic Menu
Return To Main Menu

Sound Test Menu

Monitor Patterns

The Monitor Patterns Test provides a menu for testing the monitor. Select the test with any joystick and activate with any control panel button. Once the Monitor Patterns Test is activated, move any joystick to select a test option; press any control panel button to activate the option. Press any control panel button again to return to the Monitor Patterns Test menu.

Select With Any Stick
Activate With Any Button

Red Screen
Green Screen
Blue Screen
Color Bars
Crosshatch Patterns
Back To Diagnostic Menu
Return To Main Menu

Monitor Pattern Menu

The **RED, GREEN**, and **BLUE SCREEN** tests fill the screen with either red, green or blue.
The **COLOR BARS** test fills the screen with several shades of colors to help with red, green and, blue level adjustments. Each color should appear sharp and clear.
The **CROSSHATCH PATTERNS** test fills the screen with a grid and a series of dots. The grid and the dots should be clear. The dots should appear round.

If any of the Monitor Pattern Tests shows a need for adjustment, use the proper white knobs on the Monitor Board.

Use any joystick to select RETURN TO MAIN MENU or BACK TO DIAGNOASTIC MENU and activate with any control panel button.

Burn-in Test

The Burn-in Test continually repeats the CPU Board Test. Move any joystick to select the Burn-in Test; then, press any control panel button to activate the test. When the Burn-in Test detects an error, the test stops and displays an error message on the screen. The second page of the Audit Table specifies the number of Burn-in cycles successfully completed. Use this test to find intermittent CPU problems.

To exit this test, switch the game Off then On again.

COIN BOOKKEEPING

To enter the Coin Bookkeeping from the Main Menu, move any joystick to select the Coin Bookkeeping option; then, press any control panel button to activate it.

The Coin Bookkeeping Table records the coinbox totals and game play counters. The left side of the table names the bookkeeping item; the right side shows the number of coins, credits, or plays for each item.

To exit Coin Bookkeeping, move any joystick to select RETURN TO MAIN MENU; then, press any control panel button to activate it.

Left Slot Coins	0
Right Slot Coins	0
Third Slot Coins	0
Fourth Slot Coins	0
Service Credits	0
Paid Credits	0
Total Plays	0

More Detailed Data
Return To Main Menu

Coin Bookkeeping Table

Left Slot Coins	0
Right Slot Coins	0
Third Slot Coins	0
Fourth Slot Coins	0
Total Collections	0

Clear Coin Meters
Return To Main Menu

Total Collection Table

GAME AUDITS

To enter Game Audits from the Main Menu, move any joystick to select the Game Audits option; then, press any control panel button to activate it. To advance to the next (or return to the previous) page of the Game Audit Table, move any joystick to select either "Next Audit Page", or "Previous Audit Page"; then, press any control panel button to change the page.

The Game Audits Table records the game play statistics. The left side of the table names the Audit item; the right side shows the amount of play.

Hours Game was On	0
Hours Played with 1 Player	0
Hours Played with 2 Players	0
Total Plays	0
1 Player Continues Taken	0
2 Player Continues Taken	0
Highest Battle Reached	0
Winning Streak Reset Count	0
Burn-In Loops Successfully Completed	0

Next Audit Page
Return To Main Menu

Page 1 of Audit Table

Cage Chosen	0
Kans Chosen	0
Raiden Chosen	0
Liu Kang Chosen	0
Sub-zero Chosen	0
Scorpion Chosen	0
Sonya Chosen	0
Error Traps	0

Previous Audit Page
Return To Main Menu

Page 2 of Audit Table

To exit the Game Audit Table, move any joystick to select RETURN TO MAIN MENU; then, press any control panel button to activate your selection.

GAME ADJUSTMENTS

Move any joystick to select the Game Adjustment option on the Main Menu; then, press any control panel button to activate it.

The Game Adjustments Menu allows the owner/operator to change the Game Pricing and Game Difficulty.

The Game Adjustments Menu offers several options. Each option has several choices. Move any joystick to select an option; then, press any control panel button to activate that option. The next menu screen provides a setting choice. Move any joystick to modify the setting value; then, press any control panel button to lock in the new value and return to the Adjustment Menu. Move the joystick up to increase the setting value, move the joystick down decrease the setting value.

To exit the Adjustments Menu, use any joystick to select RETURN TO MAIN MENU; then, use any control panel button to activate your selection.

Select With Any Stick
Press Any Button To Modify

Return To Main Manu
Standard Pricing
Custom Pricing
Free Play
Computer Difficulty
Winning Streak Reset
Return To Main Menu

Game Adjustment Menu

Note

Game Adjustments are explained in more detail on the following page.

Adjustment values set by DIP Switch, override adjustment values set by the menu system.

Game Adjustments

Standard Pricing

Standard Pricing allows the operator to choose any of the "Standard" selections for the Standard Pricing Table. See page 1-21.

Modify the setting value with any joystick. Press any control panel button to lock in the new value and return to the Adjustment Menu.

Custom Pricing

Custom Pricing allows the operator to install pricing other than that of the Standard Pricing Table. Custom Pricing also allows the operator to select the maximum amount of credits per game, the amount of credits required to start a game, and the amount or credits required to continue a game. This option is being adjusted from the Dip Switch Settings. See page 1-22.

Modify the setting value with any joystick. Press any control panel button to lock in a new value and return to the Adjustment Menu.

Free Play

This option selects free play. The setting choices for this adjustment are:

- No (factory)
- Yes

Computer Difficulty

This option determines the difficulty level of game play. The setting choices for this adjustment are:

-1 (Extra Easy)
-2 (Easy)
-3 (Medium; factory)
-4 (Hard)
-5 (Extra Hard)

Winning Streak Reset

This option resets the highest scores after a selected amount of games are played. The setting choices for this adjustment are:

- Reset every 5,000 games.
- Reset every 10, 000 games (factory).
- Reset every 15, 000 games.
- Do Not Reset.

Standard Pricing Table

Name	Settings Credit/Coin	Left Chute	Center Chute	Right Chute	Fourth Chute
USA 1	1/25¢ (2 to Start; 2 to Continue)	25¢		25¢	
USA 2	1/25¢ (2 to Start; 1 to Continue)	25¢		25¢	
USA 3	1/25¢ (1 to Start; 1 to Continue)	25¢		25¢	
USA 4	1/50¢, 3/$1.00 (1 to Start; 1 to Continue)	25¢		25¢	
USA 5	1/50¢, 4/$1.00 (2 to Start; 1 to Continue)	25¢		25¢	
USA 6	1/50¢ (1 to Start; 1 to Continue)	25¢		25¢	
USA 7	1/50$, 3/$1.00 (1 to Start; 1 to Continue)	25¢		25¢	
USA 8	1/50¢, 4/$1.00 (1 to Start; 1 to Continue)	25¢	$1.00	25¢	
USA ECA	1/25¢, 4/$1.00 (2 to Start; 2 to Continue)	$1.00	10¢	25$	5¢
German 1	1/1DM, 6/5DM	1 DM		5 DM	
German 2	1/1DM, 7/5DM	1 DM		5 DM	
German 3	1/1DM, 8/5DM	1 DM		5 DM	
German 4	1/1DM, 5/5DM	1 DM		5 DM	
German 5	1/1DM, 6/5DM	1DM		5DM	
German ECA	1/1DM, 2/2DM, 6/5DM	5DM	1DM	2DM	
France 1	2/5F, 5/10F	5 F		10 F	
France 2	2/5F, 4/10F	5 F		10 F	
France 3	1/5F, 3/10F	5 F		10 F	
France 4	1/5F, 2/10F	5 F		10 F	
France 5	2/5F, 5/10F, 11/2 x 10F	5F		10F	
France 6	2/5F, 4/10F, 9/2 x 10F	5F		10F	
France 7	1/5F, 3/10F, 7/2 x 10F	5F		10F	
France 8	1/5F, 2/10F, 5/2 x 10F	5F		10F	
France 9	1/3 x 1F, 2/5F	1F		5F	
France 10	1/2 x 1F, 3/5F	1F		5F	
France 11	1/3 x 1F, 2/5F, 5/2 x 5F	1F		5F	
France 12	1/2 x 1F, 3/5F, 7/2 x 5F	1F		5F	
France ECA	1/3 X 1F, 2/5F, 5/2 X 5F	1F	10F	5F	
Canada	1/2 x 25¢, 3/$1.00	25¢		$1.00	
Swiss 1	1/1F, 6/5F	1F		5F	
Swiss 2	1/1F, 7/5F	1F		5F	
Swiss 3	1/1F, 8/5F	1F		5F	
Italy	1/500 lire	500 lire		500 lire	
UK 1	1/20P, 3/50P	20P		50P	
UK 2	2/20P, 5/50P	20P		50P	
UK ECA	1/20P, 3/50 P, 7/£1.00	£1.00	20P	50P	10 P
UK Elec w/CCU	1/30P, 2/50P, 4/£1.00	£1.00		CCU	
Spain 1	1/100 peseta, 6/500 peseta	100 peseta		500 peseta	
Spain 2	1/100 peseta, 5/500 peseta	100 peseta		500 peseta	
Australia 1	1/3 x 20¢, 2/$1.00	20¢		$1.00	
Australia 2	1/5 x 20¢, 1/$1.00	20¢		$1.00	
Japan 1	1/100 yen	100 yen		100 yen	
Japan 2	2/100 yen	100 yen		100 yen	
Austria 1	1/5 schilling, 2/10 schilling	5 schilling		10 schilling	
Austria 2	1/2 x 5 schilling, 3/2 x 10 schilling	5 schilling		10 schilling	
Belgium 1	1/20F	20F		20F	
Belgium 2	3/20F	20F		20F	
Belgium 3	2/20F	20F		20F	
Belgium ECA	1/25¢, 4/$1.00	50F	5F	20F	
Sweden	1/3 x 1 krona, 2/ krona	1 krona		5 krona	
New Zealand 1	1/3 x 20¢	20¢		20¢	
New Zealand 2	1/2 x 20¢	20¢		20¢	
Netherlands	1/1HFl, 3/2.5HFl	1HFl		2.5HFl	
Finland	1/1 markka	1 markka		1 markka	
Norway	1/2 x 1 krone, 3/5 x 1 krone	1 krone		1 krone	
Denmark	1/2 x 1 krone, 3/5 krone, 7/2 x 5 krone	1 krone		5 krone	
Antillies	1/25¢, 4/1 guilder	25¢		1 guilder	
Hungary	1/2 x 10 forint, 3/2 x 20 forint	10 forint		20 forint	

If option desired is not shown above, use Custom pricing.

Custom Pricing

Select With Any Stick Press Any Button To Modify

Return To Adj. Menu (1) Left Chute Units (1) Right Chute Units (1) Third Chute Units (1) Fourth Chute Units (2) Units/Credits (3) Units/Bonus (4) Minimun Units Required (5) Credits To Start (6) Credits To Continue (7) Coins Per Dollar Maximum Credits Return To Adj. Menu

(1) Coins inserted accumulate units. This adjustment specfies the number of units given for each coin in the fourth chute (see "units/credit").

(2) This is the number of coin units required to buy one credit.

(3) One bonus credit is awarded after this many coin units have accumulated.

(4) No credits will be awarded until this many coin units have accumulated.

(5) Each player needs this many credits to begin a game.

(6) Each player needs this many credits to continue a game.

(7) The detailed bookkeeping screen shows total collections based on this many coins per dollar. (Set to zero to disable the display of money totals)

(8) This is the limit for the credits counter. Additional coins inserted will be lost (factory setting: 30)

UTILITIES

Move any joystick to select the Utilities option on the Main Menu; then, press any control panel button to activate it.

The Utilities Menu allows the owner/operator to clear the game's bookkeeping memory and to install a custom message.

Select With Any Stick
Activate With Any Button

Clear Credits
Clear Coin Counters
Clear Game Audits
Reset High Score
Default Adjustments
Full Factory Restore
Return To Main Menu

Utilities Menu

Move any joystick to select an item from the Utilities Menu; then, press any control panel button to activate that item. After an item has been activated, you are given the option of resetting that item or not. For example,

CLEAR COIN COUNTERS ?
ARE YOU SURE ?

YES
NO

Move any joystick to choose YES or NO; then, press any control panel button to lock in your choice and to return to the Utilities Menu.

To exit the Utilities Menu, move any joystick to select RETURN TO MAIN MENU; then press any control panel button to activate your selection.

TROUBLESHOOTING

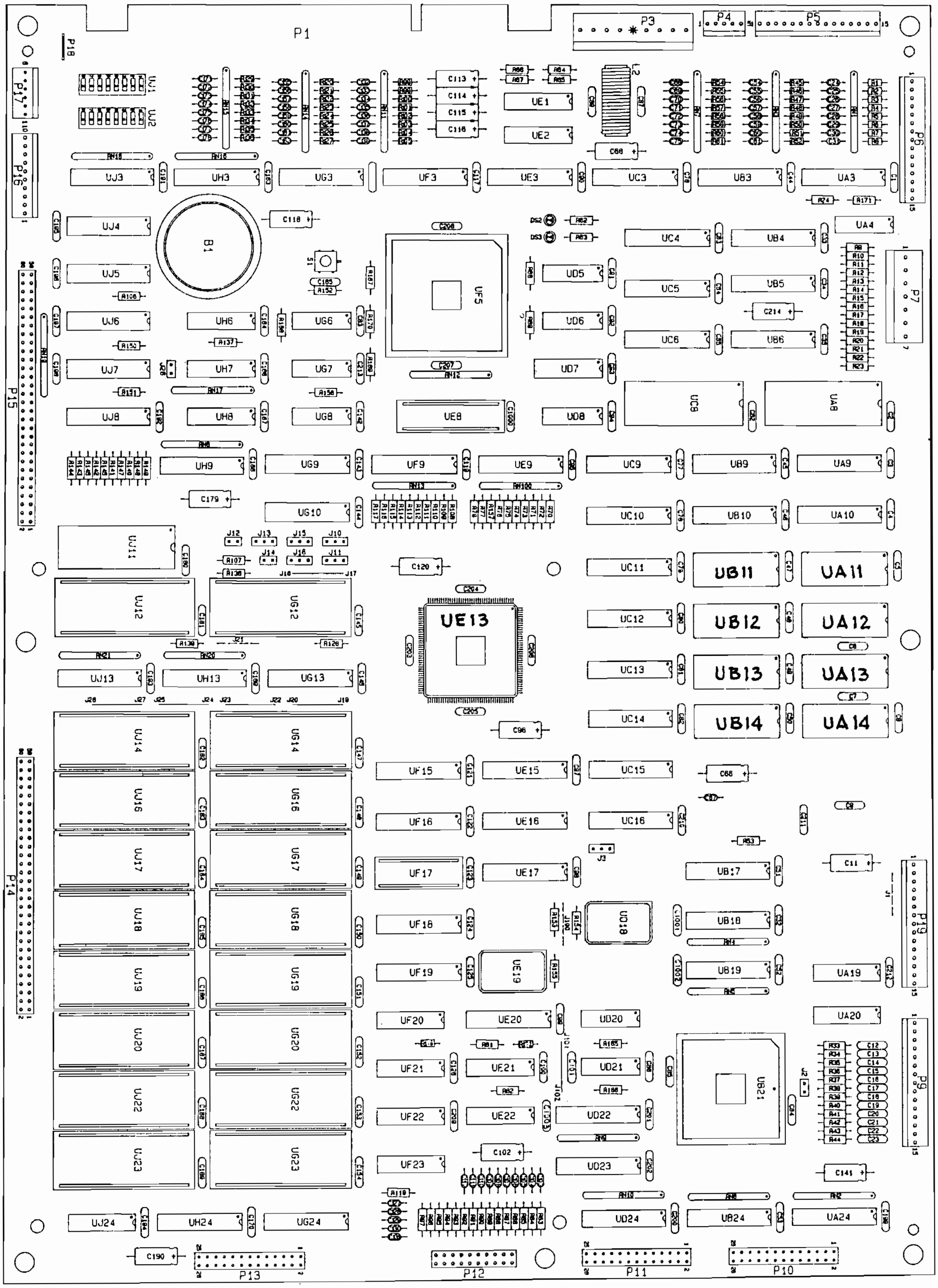
Problem	Possible Solution
NO PICTURE OR DISTORTED PICTURE.	Check for faulty video board or monitor. Check for disconnected video signal cable.
TURN GAME ON AND NOTHING HAPPENS.	Check line fuse. Check for +5Vdc at pins C, D, 3, and 4 of the JAMMA Connector.
NO SOUND.	Check the speaker and speaker connection to pins L and 10 on the JAMMA Connector. Check volume control setting. Check for +12V dc at pins F and 6 on the JAMMA Connector. Check interboard wiring from CPU Board to the Sound Board.
MOVE JOYSTICK AND THE SCREEN PLAYER DOES NOT MOVE.	Check for open wires between the joystick and CPU Board. Check for contamination on joystick switch contacts and CPU Board pins. Check for proper ground.
PRESS START BUTTON AND NOTHING HAPPENS.	Check for open wires between the button and CPU Board. Check for contamination on CPU Board pins or the button switch blade contacts. Check for proper ground.
PRESS ANY CONTROL PANEL BUTTON AND SCREEN PLAYER DOES NOT MOVE.	Check for open wires between the button and CPU Board. Check for contamination on CPU Board pins or the button switch blade contacts. Check for proper ground.
NO CREDIT GIVEN WHEN COINS ARE INSERTED.	Check DIP switch coin setting. Check for contamination on coin switch contacts. Check for an open wire between Coin Switch 1 and pin 16 on the JAMMA Connector or Coin Switch 2 and pin T of the JAMMA Connector.
TOO MANY CREDITS FOR NUMBER OF COINS INSERTED.	Check Game Pricing setting. Check for a short between pins T & 16 on the JAMMA Connector.
GAME STAYS IN TEST MODE.	Check that the Test Switch in the coin door is set to Off.

Mortal Kombat Kit
Using the T-Unit CPU

SECTION
two

PC Board Parts

A-14816-43725
CPU Board Assembly



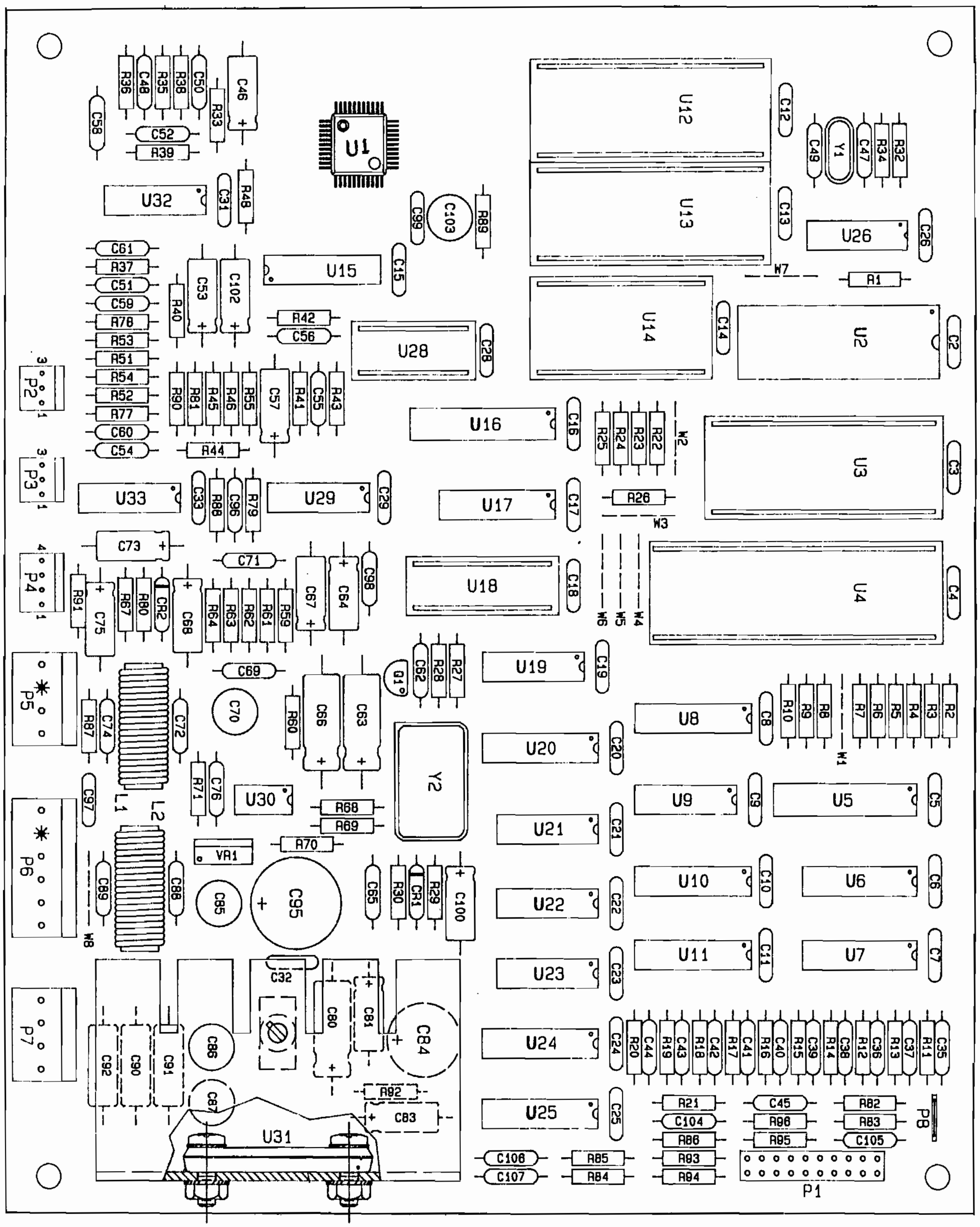
A-14816-43725
CPU Board Parts

Part Number	Part Designator	Description
5434-12255-00	UH6	MAX691
5370-12602-00	UE1	ULN2064
5340-12958-00	UE22, UF22, UF23	26LS31
5340-12959-00	UE21, UF20, UF21	26LS32A
5340-13020-00	UJ4, UJ5, UJ6, UJ7	44C256
5340-12558-00	UJ11	5565
5340-13322-00	UA8, UC8	5C2568
5283-10551-00	UG8	74F00
5283-10552-00	UD6	74F04
5281-09215-00	UD8	74LS04
5280-09309-00	UA4	7407
5283-12488-00	UG6	74F08
5281-09500-00	UD20, UG7	74LS32
5321-13466-00	UD21	74AC74
5281-09737-00	UD5	74LS86
5281-09745-00	UH8	74LS138
5281-13438-00	UH7	74LS155A
5281-09733-00	UE2	74LS174
5320-13437-00	UD22	74ACTQ244
5283-12890-00	UB24, UD23	74F244
5281-09867-00	UG9	74LS244
5320-13436-00	UB18, UB19	74ACTQ245
5283-12889-00	UA24, UD24	74F245
5283-13319-00	UD7	74F253
5283-13320-00	UB9, UF9, UF18, UG10	74F373
5317-12211-00	UB4, UC4	74ALS541
5010-13372-00	R81	220 Ω Res. 5%, 1/8W
5010-13371-00	R62-R67	330 Ω Res. 5%, 1/8W
5040-09343-00	C11, C66, C88, C96, C102, C113-C116, C118, C120, C141, C179, C190, C214	10uF Cap., 20V
5019-09362-00	RN1-RN3, RN6, RN7,RN9-RN12, RN14-RN18,RN100	4.7K Ω Res SIP, 5%, 1/8W
5521-13424-01	UD18	50MHz Oscillator
5645-09025-00	SW1, SW2	DIP, 8-switch
5317-12208-00	UB6, UC6, UC11, UC12, UC13, UC14, UE15, UE16, UF15, UF16, UH9, UH13, UJ8, UJ13	74ALS245
5010-13363-00	R24, R69, R82-R97, R119, R128, R137, R148, R151, R171	100 Ω Res. 5%, 1/8W
5010-13366-00	R1-R8, R45-R52, R54-R61, R98-R105, R118, R120-R127, R129-R136, R172	470 Ω Res. 5%, 1/8W
5043-08980-00	C1-C4, C9, C10, C32-C35,. C44-C46, C51-C53, C62-C65, C76-C86, C90-C95, C97-C101, C117, C119, C121-C126, C140, C142-C154, C163, C164, C166-C170, C180-C189, C191-C194, C199-C213, C1000	01uF Cap.,
5880-11056-00	B1	Battery, Lithium 3.0V
5400-12220-00	UB21	TMS34010-50
A-16217	UE8	20L8
5410-13508-00	UF5	1020A-1
A-16093	UF17	16L8
56411-12551-00	S1	Sw-Push Button

Part Number	Part Designator	Description
5010-13369-00	R10, R17, R22	8.2K Ω Res. 5%, 1/8W
5010-13370-00	R9, R18, R23	15K Ω Res. 5%, 1/8W
5048-11030-00	C165	470pF Cap., 10%
5048-11031-00	C87, C89	.001uF Cap., 10%
5671-09019-00	DS2, DS3	LED, Red
5551-09822-00	L2	4.7uH Coil, 3.0A
5881-12315-00	B1	Battery Holder
5700-09915-00	UF17	20 Pin Socket
5700-12047-00	UE8	24 Pin Socket
5700-12253-00	UB21	68 Pin Socket
5700-12424-00	UF5	84 Pin Socket
5791-12461-05	P4	5 Pin Header
5791-12461-06	P17	6 Pin Header
5791-12461-10	P16	10 Pin Header
5791-12461-15	P5, P6	15 Pin Header
5791-10862-07	P7	7 Pin Header
5791-10862-09	P3	9 Pin Header
5791-09437-00	P12	20 Pin Header
5019-09669-00	RN4, RN5, RN13	1K Ω Res. 5%, 1/8W
5010-13472-00	J100, J101	47 Ω Res. 5%, 1/8W
5010-13473-00	R155	39 Ω Res. 5%, 1/8W
5010-13474-00	R158, R167-R170	68 Ω Res. 5%, 1/8W
5010-09534-00	J18, J19, J22, J24, J28, R154	0 Ω Res. Jumper
5010-13362-00	R12, R15, R20	2K Ω Res. 2%, 1/8W
5010-13368-00	R11, R16, R21	3.9K Ω Res. 5%, 1/8W
5281-12887-00	UE9, UH3, UJ3	74LS541
5521-13424-03	UE19	8MHz Oscillator
5048-13375-00	C24-C31, C54-C61, C67-C75, C103-C112, C127-C139, C155-C162, C171-C178	100pF Cap.,10%
5010-13365-00	R53, R107, R138, R139, R152, R157, R165, R166	4.7K Ω Res. 5%, 1/8W
5010-13361-00	R13, R14, R19	1K Ω Res. 2%, 1/8W
5315-13435-00	UA3, UB3, UC3, UE3, UF3, UG3	74HCT541
5010-13364-00	R70-R77, R79, R106, R108-R117, R140-R147, R149, R150	33 Ω Res. 5%, 1/8W
5281-09486-00	UA9, UA10, UB5, UB10, UC5, UC9, UC10, UC15, UC16, UE17, UE20, UF19, UG13	74LS374
5043-08996-00	C5-C8, C47-C50, C195-C198,C1001-C1003	.1uF Cap., 20%
5700-12088-00	UG12, UG14, UG16-UG20, UG22, UG23, UJ12, UJ14, UJ16-UJ20, UJ22, UJ23	32 Pin Socket
A-5343-43725-14	UG12	EPROM
A-5343-43725-1	UG14	EPROM
A-5343-43725-5	UG16	EPROM
A-5343-43725-9	UG17	EPROM
A-5343-43725-3	UG19	EPROM
A-5343-43725-7	UG20	EPROM
A-5343-43725-11	UG22	EPROM
A-5343-43725-13	UJ12	EPROM
A-5343-43725-2	UJ14	EPROM
A-5343-43725-6	UJ16	EPROM
A-5343-43725-10	UJ17	EPROM
A-5343-43725-4	UJ19	EPROM
A-5343-43725-8	UJ20	EPROM
A-5343-43725-12	UJ22	EPROM
5410-12862-00	UE13	IC, DMA2
5340-13321-00	UA11-UA14, UB11-UB14	IC, 48121, 80nsec

Notes: 1. See Section 3 For Schematic; .2 * = Not for individual sale.

A-14732-43725
Sound Board Assembly



A-14732-43725
Sound Board Parts

Part Number	Part Designator	Description
5340-12958-00	U7, U11, U24	IC, 26LS31
5340-12959-00	U6, U10, U25	IC, 26LS32
5281-09850-00	U19	IC, 74LS11
5281-09215-00	U26	IC, 74LS04
5281-09851-00	U21	IC, 74LS14
5281-09487-00	U9, U22, U23	IC, 74LS74
5281-09745-00	U8	IC, 74LS138
5281-09246-00	U20	IC, 74LS139
5281-09733-00	U17	IC, 74LS174
5281-09486-00	U5, U16	IC, 74LS374
5340-12278-00	U2	IC, 2064 Static RAM
5370-12260-00	U30	IC, 3340 Attenuator
5370-12960-00	U29	IC, LM324 OP Amp
5370-12730-00	U32, U33	IC, TL084 OP Amp
5371-12727-00	U15	AD7524 DAC
5370-13308-00	U31	*MB3731 Audio Amp.
5521-10931-00	Y2	8Mhz Oscillator
5520-09020-00	Y1	3.58Mhz Crystal
5010-09534-00	W2, W3, W5, W7, W8	0Ω Resistor
5010-09039-00	R89	10Ω Res., 5%, 1/4W
5010-10170-00	R11-R21, R93-R96	47Ω Res., 5%, 1/4W
5010-09036-00	R4, R30, R90	100Ω Res., 5%, 1/4W
5010-09187-00	R27	150Ω Res., 5%, 1/4W
5010-09160-00	R82	220Ω Res., 5%, 1/4W
5010-09416-00	R32, R34, R41, R83	470Ω Res., 5%, 1/4W
5010-09358-00	R43, R68	1KΩ Res., 5%, 1/4W
5010-08998-00	R22-R24, R26, R59, R61	2.2KΩ Res., 5%, 1/4W
5010-08983-00	R28	3.3KΩ Res., 5%, 1/4W
5010-10000-00	R87	3.9KΩ Res., 5%, 1/4W
5010-08991-00	R1-R3, R5-R10, R25, R84-R86, R91	4.7KΩ Res., 5%, 1/4W
5010-09219-00	R69	8.2KΩ Res., 5%, 1/4W
5010-09034-00	R35, R36, R38, R39, R62, R63, R67, R70, R80	10KΩ Res., 5%, 1/4W
5010-09269-00	R64	12KΩ Res., 5%, 1/4W
5010-09324-00	R88	27KΩ Res., 5%, 1/4W
5010-09035-00	R29, R53, R81	47KΩ Res., 5%, 1/4W
5010-10987-00	R77, R78	56KΩ Res., 5%, 1/4W
5010-10650-00	R45, R51	62KΩ Res., 5%, 1/4W
5010-08776-00	R71	68KΩ Res., 5%, 1/4W
5010-13215-00	R54	200Ω Res., 5%, 1/4W
5010-12927-00	R79	82KΩ Res., 5%, 1/4W
5010-09162-00	R33, R48, R55, R60, R92	100KΩ Res., 5%1/4
5010-09134-00	R40, R44, R46, R52	150KΩ Res., 5%, 1/4W
5010-12964-00	R37, R42	820KΩ Res., 5%, 1/4W
5048-11027-00	C59, C60	33pF Cap., 10%
5043-10264-00	C62	68pF Cap., 10%
5043-09492-00	C35-C45, C47, C49, C98, C104-C107	100pF Cap., 10%
5048-12748-00	C54, C61, C96	220pF Cap., 10%
5048-11030-00	C71	470pF Cap., 10%
5048-11031-00	C55, C76	1000pF Cap., 10%
5048-11065-00	C69	2200pF Cap., 10%
5048-11080-00	C52, C58	6800pF Cap., 10%
5048-11072-00	C48, C50, C51, C56	3300pF Cap., 10%

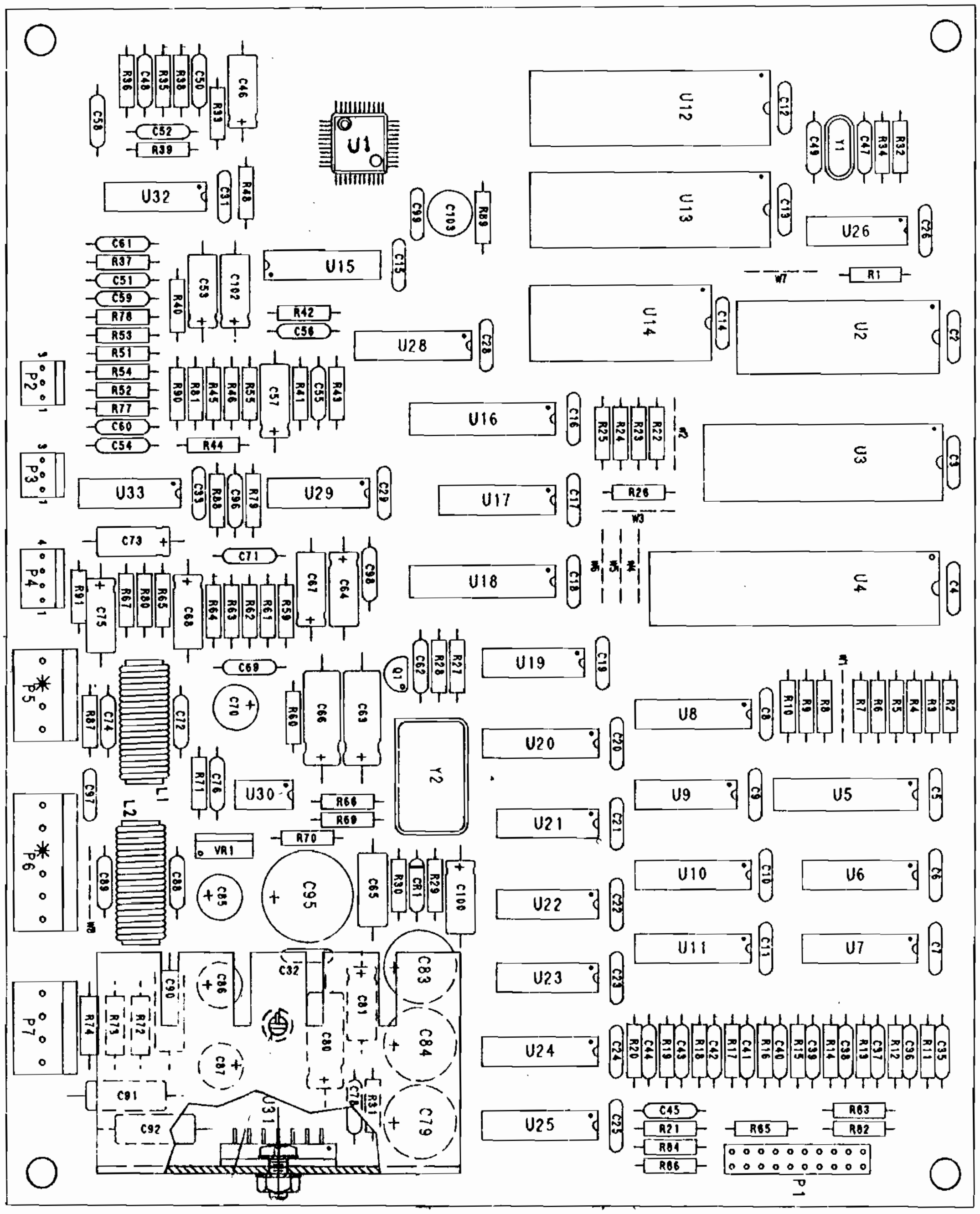
Part Number	Part Designator	Description
5043-08980-00	C2-C26, C28, C29, C31-C33, C97, C99	.01uF Cap.
5045-12926-00	C90-C92	.1uF Cap., 10%
5043-08996-00	C72, C74, C88, C89	.1uF Cap., 20%
5048-12036-00	C65	.22uF Cap., 20%
5040-09365-00	C68	1uF, Cap.,
5040-09343-00	C46, C53, C57, C64, C67, C73, C75, C81 C83, C100, C102	10uF Cap., 20V, 20%
5040-09332-00	C63, C66, C80	47uF Cap., 25V
5040-09421-00	C70, C85-C87, C103	100uF Cap., 25V
5040-09506-00	C84	220u0F Cap., 16V
5040-12314-00	C95	2200uF Cap., 25V
5070-08919-00	CR1	1N4148 Diode
5075-13409-00	CR2	Diode, 1N5232
5160-12891-00	Q1	MPS3646 Trans.
5551-09822-00	L1, L2	4.7uH Inductor, 3A
5371-11087-00	U28	YM 3012 D/A IC
5700-09915-00	U18	20-pin Socket
5370-11086-00	U14	YM 2151 Snd Genic
5400-10320-00	U4	6809E MPU IC
5700-12088-00	U3, U12, U13	32-pin Socket
5791-10862-04	P5, P7	4-pin Header
5791-10872-06	P6	6-pin Socket
5791-09437-00	P1	20-pin Header
01-10516		Heat Sink
4406-01128-00		6-32 Hex Nut
4006-01003-00		6-32 x 3/8 P-PH-S
20-9690-18		Spacer
A-5343-40025-19	U3	EPROM
A-5343-40025-20	U12	EPROM
A-5343-40025-21	U13	EPROM
5460-12743-00	VR1	7809
03-8338-1		Mtg. Spacer 1/4"
A-5346-40025-9	U18	IC, PLD Sound
5433-12962-00	U1	IC, OKI6295, 4 Channel

***NOTE**

Check the audio amp on the Sound board to determine which Sound Board sub-assembly this kit contains. This parts list is for the A-15739 sub-assembly which uses the MB3731 audio amp.

Notes: 1. See Section 3 For Schematic; 2. * = Not for individual sale

A-14732-40025
Sound Board Assembly



A-14732-40025
Sound Board Parts

Part Number	Designator	Description
5340-12958-00	U7, U11, U24	IC, 26LS31
5340-12959-00	U6, U10, U25	IC, 26LS32
5281-09850-00	U19	IC, 74LS11
5281-09215-00	U26	IC, 74LS04
5281-09851-00	U21	IC, 74LS14
5281-09487-00	U9, U22, U23	IC, 74LS74
5281-09745-00	U8	IC, 24LS138
5281-09246-00	U20	IC, 74LS139
5281-09733-00	U17	IC, 74LS174
5281-09486-00	U5, U16	IC, 74LS374
5340-12278-00	U2	IC, Static RAM, 8K x 8
5370-12260-00	U30	IC, 3340 Attenuator
5460-12743-00	VR1	IC, 7809 Regulator, +9V
5370-12960-00	U29	IC, LM324 Op Amp
5370-12730-00	U32, U33	IC, TL084 Op Amp
5371-12727-00	U15	AD7524 DAC
5370-12963-00	U31	HA13116 Pwr. Amp
5521-10931-00	Y2	8Mhz Oscillator
5520-09020-00	Y1	3.58 Mhz Crystal
5010-09534-00	W2, W3, W5,W7, W8	0Ω Resistor
5010-12961-00	R72-R74	3.3Ω Res., 5%, 1/2W
5010-09039-00	R89	10Ω Res., 5%, 1/4W
5010-10170-00	R11-R21	47Ω Res., 5%, 1/4W
5010-09036-00	R4, R30, R90	100Ω Res., 5%, 1/4W
5010-09187-00	R27	150Ω Res., 5%, 1/4W
5010-09160-00	R83	220Ω Res., 5%, 1/4W
5010-09416-00	R32, R43, R41, R82	470Ω Res., 5%, 1/4W
5010-09358-00	R43, R68	1KΩ Res., 5%, 1/4W
5010-08998-00	R22-R24, R26, R59, R61	2.2KΩ Res., 5%, 1/4W
5010-08983-00	R28	3.3KΩ Res., 5%, 1/4W
5010-10000-00	R87	3.9KΩ Res., 5%, 1/4W
5010-08991-00	R1-R3, R5-R10, R25, R84-R86, R91	4.7KΩ Res., 5%, 1/4W
5010-09219-00	R69	8.2KΩ Res., 5%, 1/4W
5010-09034-00	R62, R63, R67, R70, R80	10KΩ Res., 5%, 1/4W
5010-09269-00	R64	12KΩ Res., 5%, 1/4W
5010-09324-00	R68	27KΩ Res., 5%, 1/4W
5010-09325-00	R36	39KΩ Res., 5%, 1/4W
5010-09035-00	R29, R53, R81	47KΩ Res., 5%, 1/4W
5010-10987-00	R77, R78	56KΩ Res., 5%, 1/4W
5010-10650-00	R38, R45, R51	62KΩ Res., 5%, 1/4W
5010-08776-00	R31, R71	68KΩ Res., 5%, 1/4W
5010-10257-00	R35	75KΩ Res., 5%, 1/4W
5010-12927-00	R79	82KΩ Res., 5%, 1/4W
5010-09162-00	R33, R48, R54, R55, R60, R65	100KΩ Res., 5%, 1/4W
5010-12965-00	R39	130KΩ Res., 5%, 1/4W
5010-09134-00	R40, R44, R46, R52	150KΩ Res., 5%, 1/4W
5010-12964-00	R37, R42	820KΩ Res., 5%, 1/4W
5048-11027-00	C59, C60	33pf Cap., 10%
5043-10264-00	C50, C62	68pf Cap., 10%
5043-09492-00	C35-C45, C47, C49, C98	100pf Cap., 10%
5048-12748-00	C54, C61, C96	220pf Cap., 10%
5048-11030-00	C71	470pf Cap., 10%
5048-12506-00	C78	820pf Cap., 10%
5048-11031-00	C48,C55, C76	1000pf Cap., 10%
5048-11065-00	C69	2200pf Cap., 10%
5048-12967-00	C58	2700pf Cap., 10%
5048-11072-00	C51, C56	3300pf Cap., 10%
5048-12966-00	C52	3900pf Cap., 10%
5043-08980-00	C2-C26, C28, C29, C31-C33, C97, C99	.01µf Cap., 10%
5045-12926-00	C90-C92	.1µf Cap., 10%
5043-08996-00	C72, C74, C88, C89	.1µf Cap., 20%
5048-12036-00	C65	.22µf Cap., 10%
5040-09365-00	C68	1µf Cap.,
5040-09343-00	C46, C53, C57, C64, C67C73, C75, C81, C100, C102	10µf Cap., 16V, 20%
5040-09332-00	C63, C66, C80	47µf Cap., 25V

Part Number	Designator	Description
5040-09421-00	C70, C85-C87, C103	100µf Cap., 25V
5040-09506-00	C79, C83, C84	220µf Cap., 16V
5040-12670-00	C95	2200µf Cap., 16V
5070-08919-00	CR1	1N4148 Diode
5160-12891-00	Q1	MPS3646 Trans.
5551-09822-00	L1, L2	4.7µH Inductor, 3A
5700-09006-00	U28	16-pin Socket
5700-09915-00	U18	20-pin Socket
5700-09004-00	U14	24-pin Socket
5700-08985-00	U4	40-pin Socket
5700-12088-00	U3, U12, U13	32-pin Socket
5791-10862-04	P5, P7	4-pin Header
5791-10862-06	P6	6-pin Header
5791-09437-00	P1	20-pin Header
01-10516		Heat Sink
4406-01128-00		6-32 Hex Nut
4006-01003-06		6-32 x 3/8 P-PH-S
20-9690-18		Spacer, 1-1/8
A-5343-40025-19	U3	IC, EPROM
5400-10320-00	U4	IC, 68B09E, MPU
A-5343-40025-20	U12	IC, EPROM
A-5343-40025-21	U13	IC, EPROM
5370-11086-00	U14	IC, YM2151 Sound Generator
A-5346-40025-9	U18	IC, PLD Sound
5371-11087-00	U28	IC, YM3012 DAC
5433-12962-00	U1	IC, OKI6295, 4 Channel
03-8338-1		Mtg. Spacer, 1/4"

***NOTE**

Check the audio amp on the Sound board to determine which Sound Board sub-assembly this kit contains. This parts list is for the A-14733 sub-assembly which uses the HA13116 audio amp.

NOTES

Mortal Kombat
Kit
Using the T-Unit CPU

S E C T I O N
three

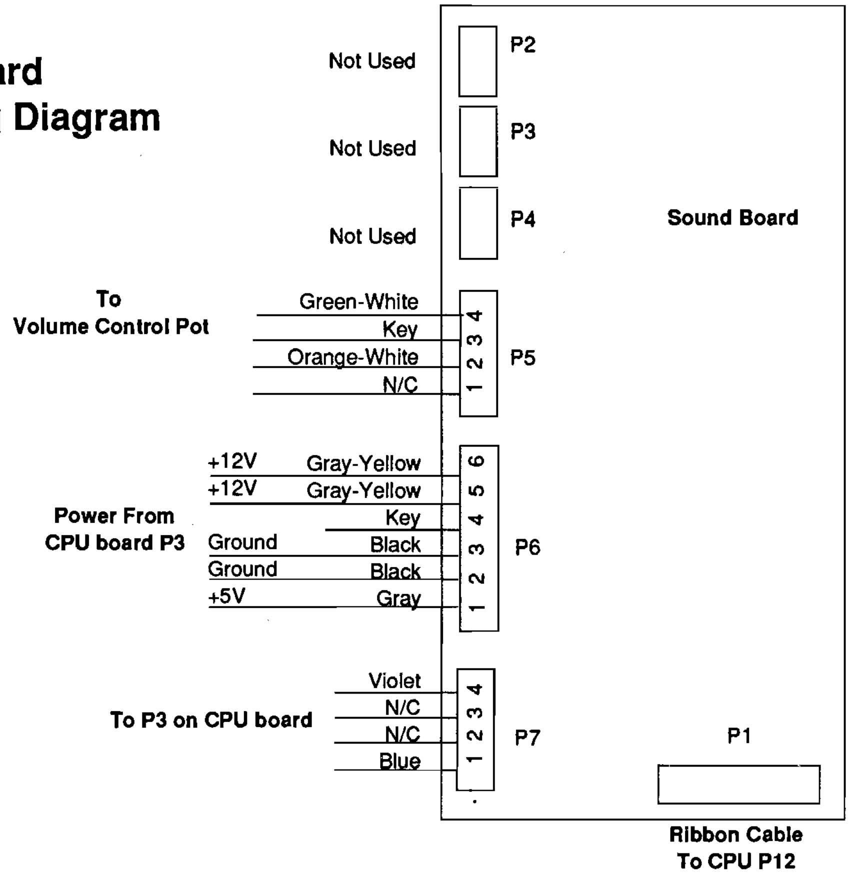
Schematics and Wiring Diagrams

JAMMA Chart

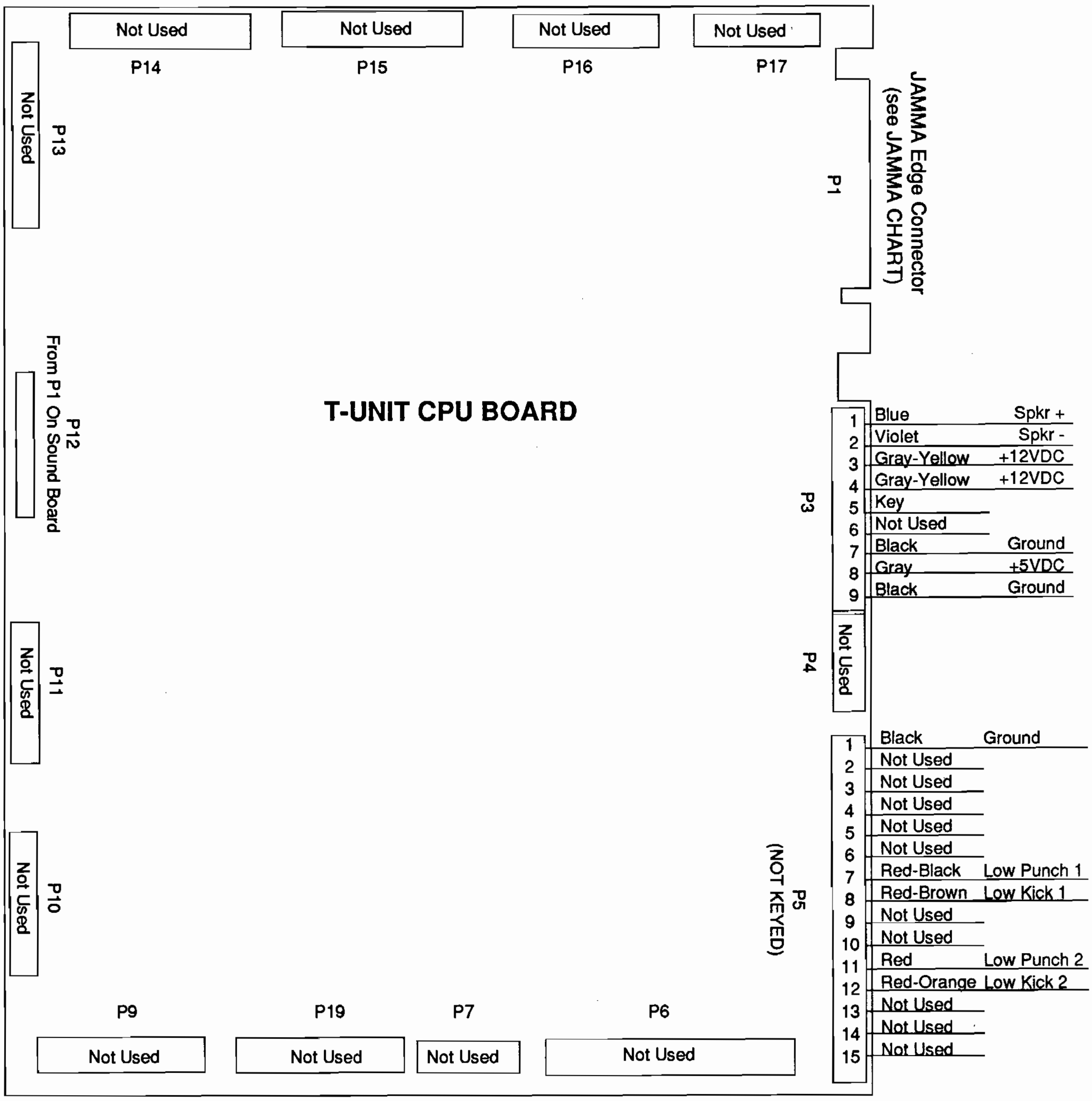
Function	Wire Color	Pin	Pin	Wire Color	Function
Ground	Black	1	A	Black	Ground
Ground	Black	2	B	Black	Ground
+5 Volts DC	Gray	3	C	Gray	+5 Volts DC
+5 Volts DC	Gray	4	D	Gray	+5 Volts DC
-5 Volts DC	Gray-Green	5	E	Gray-Green	-5 Volts DC
+12 Volts DC	Gray-Yellow	6	F	Gray-Yellow	+12 Volts DC
	Key	7	H	Key	
Counter 1 *	White-Orange	8	J	White-Green	Counter 2 *
	N/C	9	K	N/C	
Speaker (+)	Red-Violet	10	L	Green-Violet	Speaker (-)
	N/C	11	M	N/C	
Video Red	Red	12	N	Green	Video Grn
Video Blue	Brown	13	P	White	Video Sync
Video Grd	Shield	14	R	White-Red	Service Credit *
Test *	Green	15	S	White-Violet	Slam Tilt *
1 Coin	White-Blue	16	T	Yellow-White	2 Coin
1 Start	Yellow-Green	17	U	Yellow-Blue	2 Start
1 Up	Orange-Black	18	V	Yellow-Black	2 Up
1 Down	Orange-Brown	19	W	Yellow-Brown	2 Down
1 Left	Orange-Red	20	X	Yellow-Red	2 Left
1 Right	Orange	21	Y	Yellow-Orange	2 Right
1 High Punch	Orange-Yellow	22	Z	Yellow-Violet	2 High Punch
1 Block	Orange-Green	23	a	Yellow-Gray	2 Block
1 High Kick	Orange-Blue	24	b	Violet-Black	2 High Kick
Not Used	Orange-Violet	25	c	Violet-Brown	Not Used
Not Used	N/C	26	d	N/C	Not Used
Ground	N/C	27	e	N/C	Ground
Ground	Black	28	f	Black	Ground

* Optional Switches

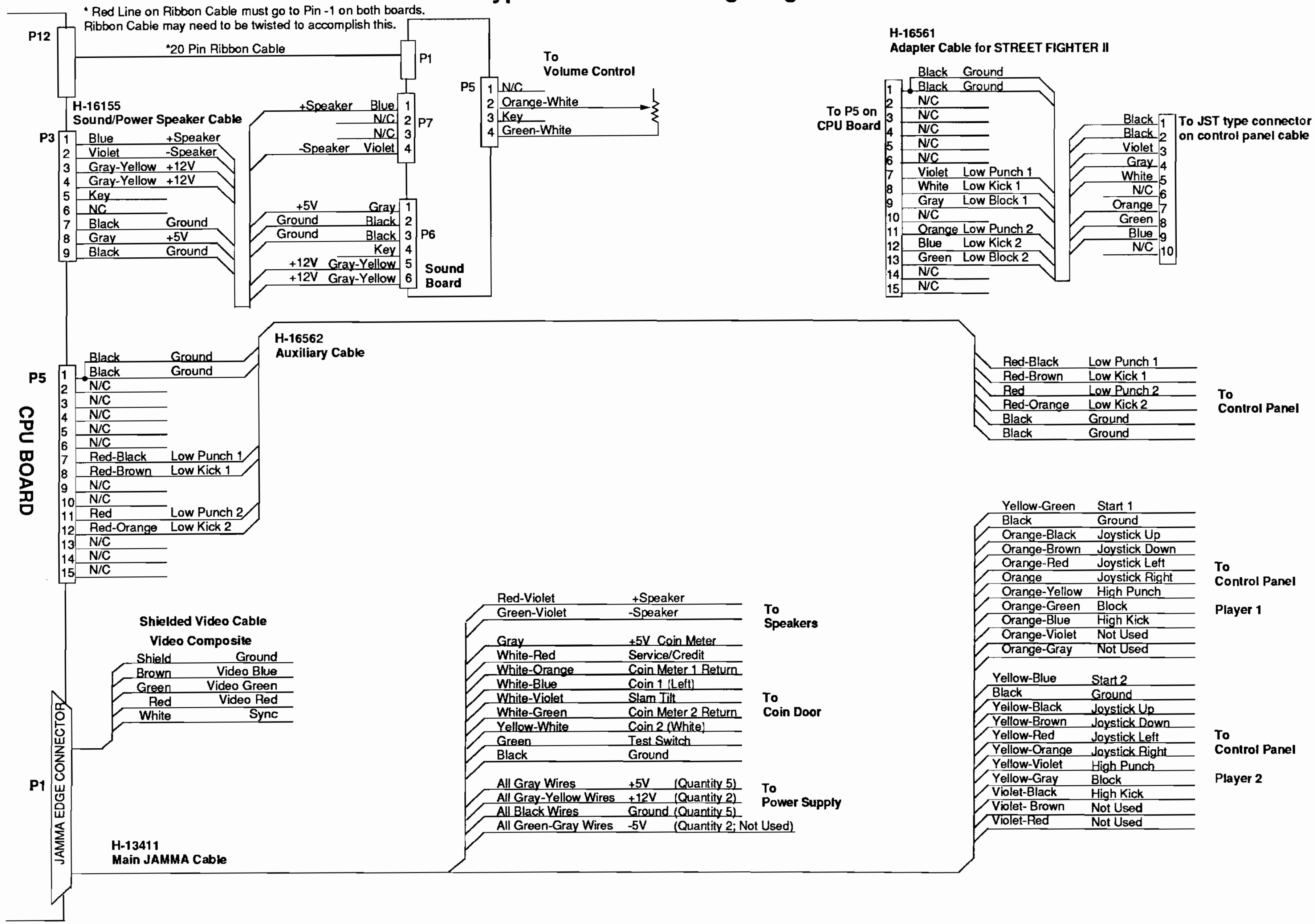
Sound Board Interboard Wiring Diagram



CPU Board
Interboard Wiring Diagram

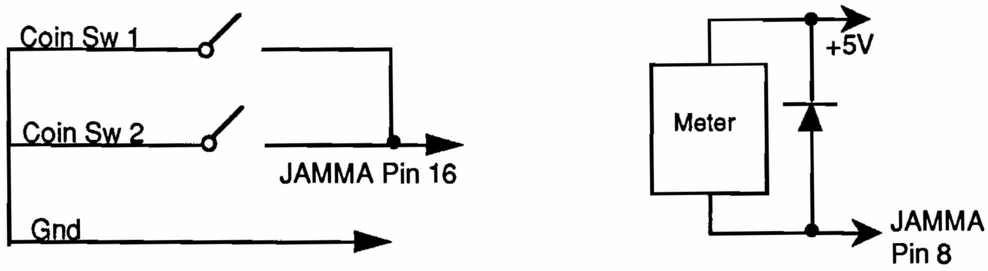


Typical Cabinet Wiring Diagram

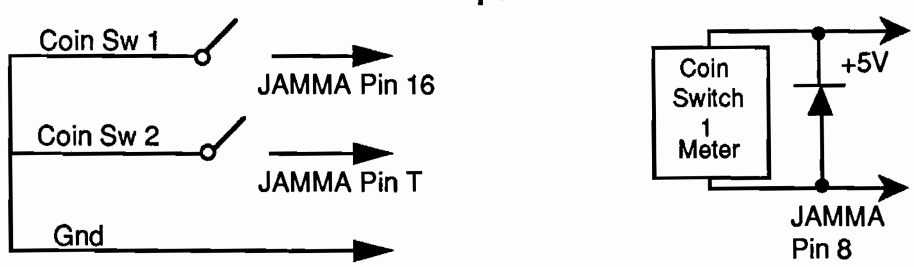


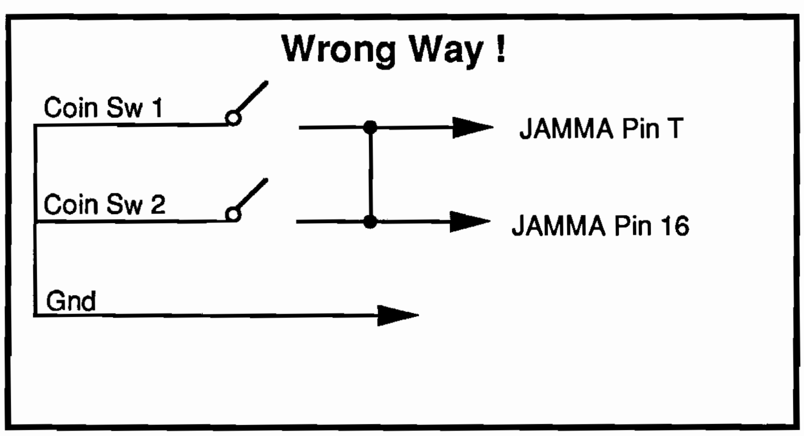
Coin Switch and Meter Wiring

Option 1



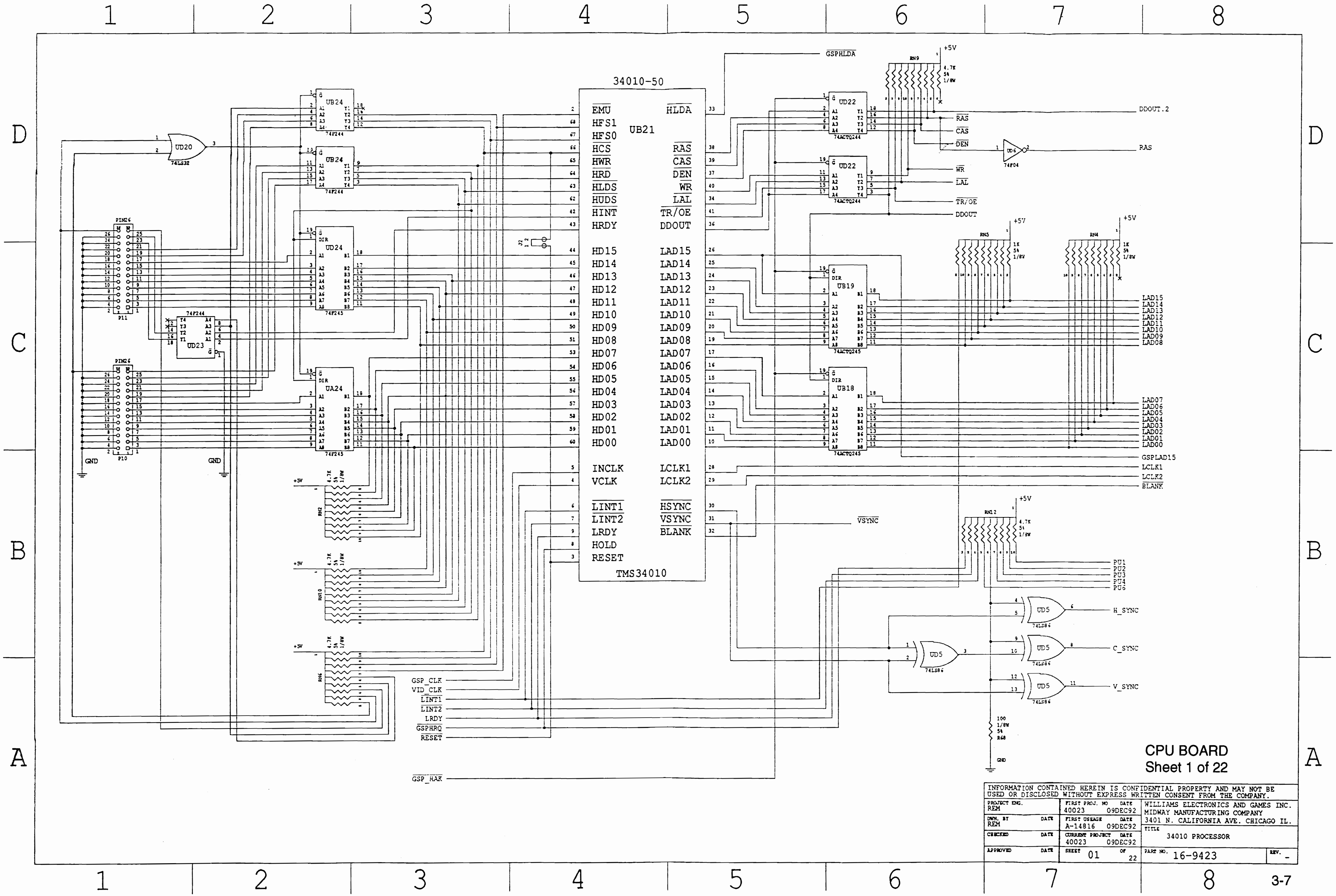
Option 2

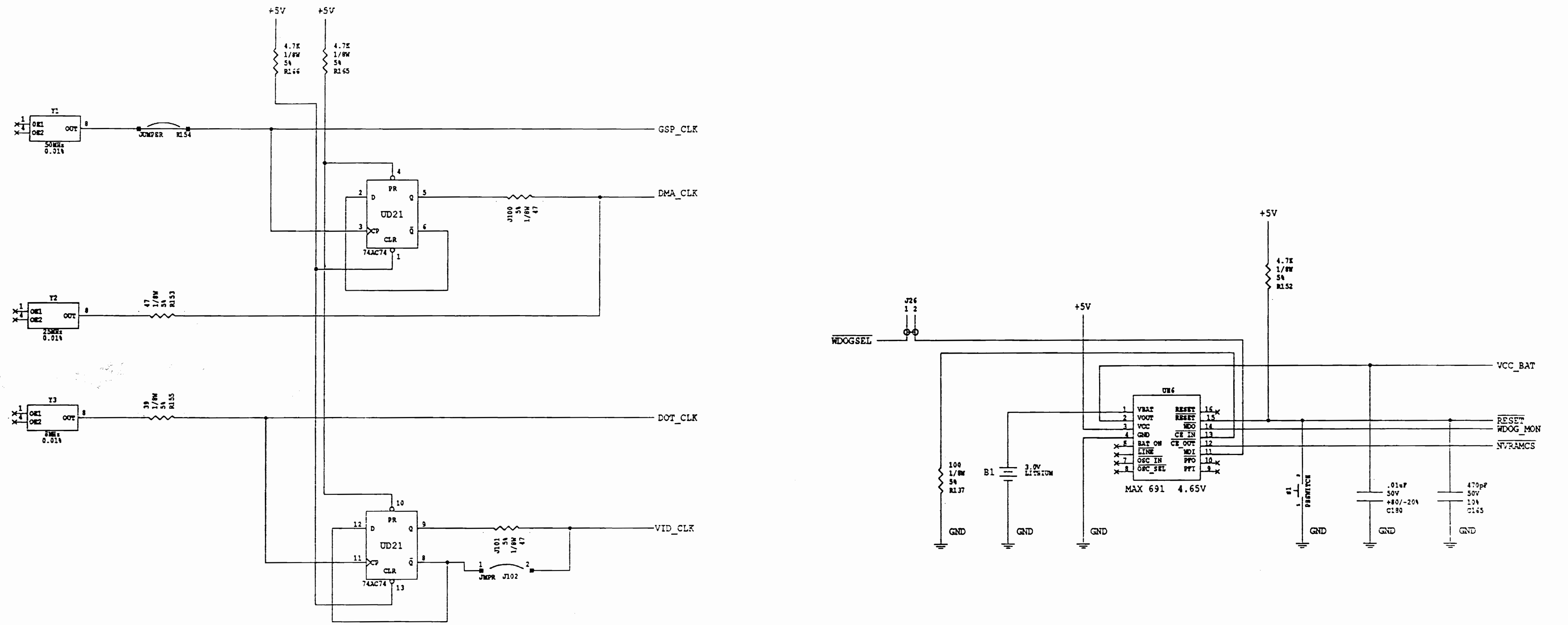




Do NOT Connect the coin switches this way.
This Circuit is INCORRECT and will cause twice as many credits per coin.

NOTES

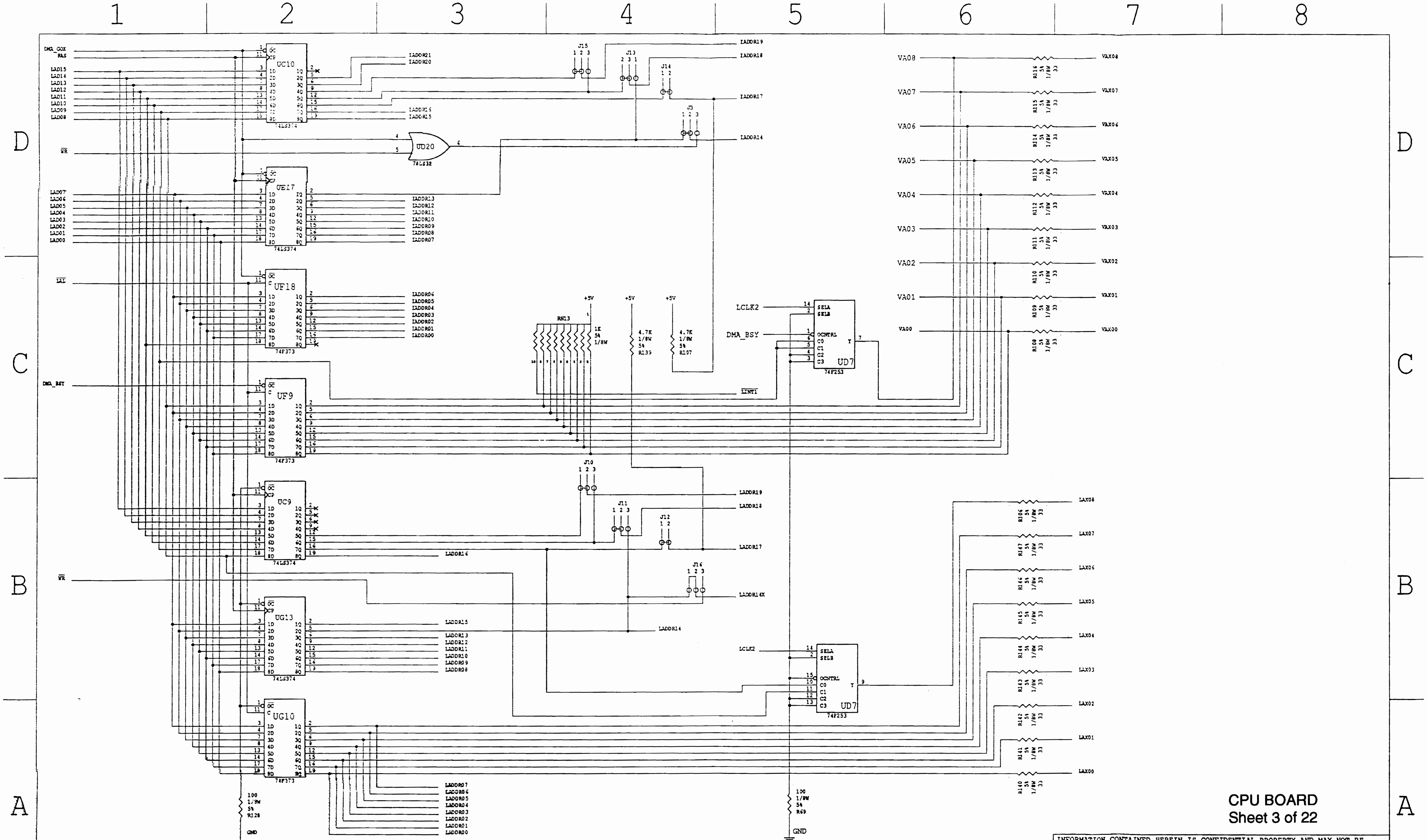

34010-50
UB21
TMS34010
EMU
HFS1
HFS0
HCS
HWR
HRD
HLDS
HUDS
HINT
HRDY
HD15
HD14
HD13
HD12
HD11
HD10
HD09
HD08
HD07
HD06
HD05
HD04
HD03
HD02
HD01
HD00
INCLK
VCLK
LINT1
LINT2
LRDY
HOLD
RESET
HLDA
RAS
CAS
DEN
WR
LAL
TR/OE
DDOUT
LAD15
LAD14
LAD13
LAD12
LAD11
LAD10
LAD09
LAD08
LAD07
LAD06
LAD05
LAD04
LAD03
LAD02
LAD01
LAD00
LCLK1
LCLK2
HSYNC
VSYNC
BLANK
UD20
74LS32
UB24
74F244
UA24
74F245
UD23
UD22
74ACTQ244
UB19
UB18
74ACTQ245
UD6
74F04
UD5
74LS86
P11
P10
PIN26
RN2
RN10
RN6
RN9
RN5
RN4
RN12
+5V
4.7K
5%
1/8W
1K
GND
GSPHLDA
DDOUT.2
GSPLAD15
PU1
PU2
PU3
PU4
PU5
H_SYNC
C_SYNC
V_SYNC
GSP_CLK
VID_CLK
GSPHRQ
GSP_HAK
100
R68
CPU BOARD
Sheet 1 of 22
INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.
PROJECT ENG. REM
DWN. BY REM
CHECKED
APPROVED
FIRST PROJ. NO 40023 DATE 09DEC92
FIRST USEAGE A-14816 DATE 09DEC92
CURRENT PROJECT 40023 DATE 09DEC92
SHEET 01 OF 22
WILLIAMS ELECTRONICS AND GAMES INC.
MIDWAY MANUFACTURING COMPANY
3401 N. CALIFORNIA AVE. CHICAGO IL.
TITLE 34010 PROCESSOR
PART NO. 16-9423
REV. -



CPU BOARD
Sheet 2 of 22

INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.

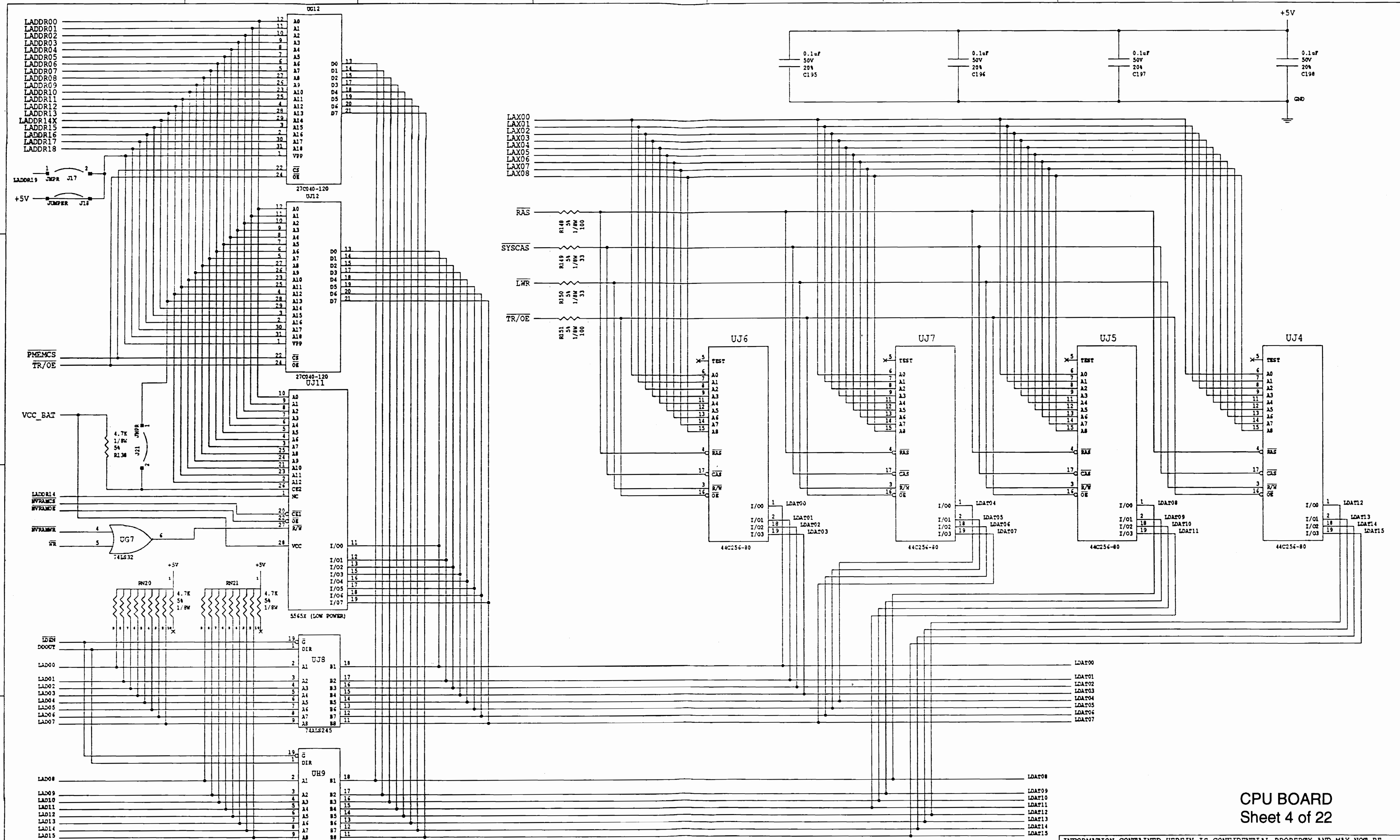
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DWN. BY REM DATE	FIRST USAGE A-14816 DATE 09DEC92	TITLE
CHECKED DATE	CURRENT PROJECT 40023 DATE 09DEC92	CLOCK GENERATION/POWER MONITOR
APPROVED DATE	SHEET 02 OF 22	PART NO. 16-9423 REV. -



CPU BOARD
Sheet 3 of 22

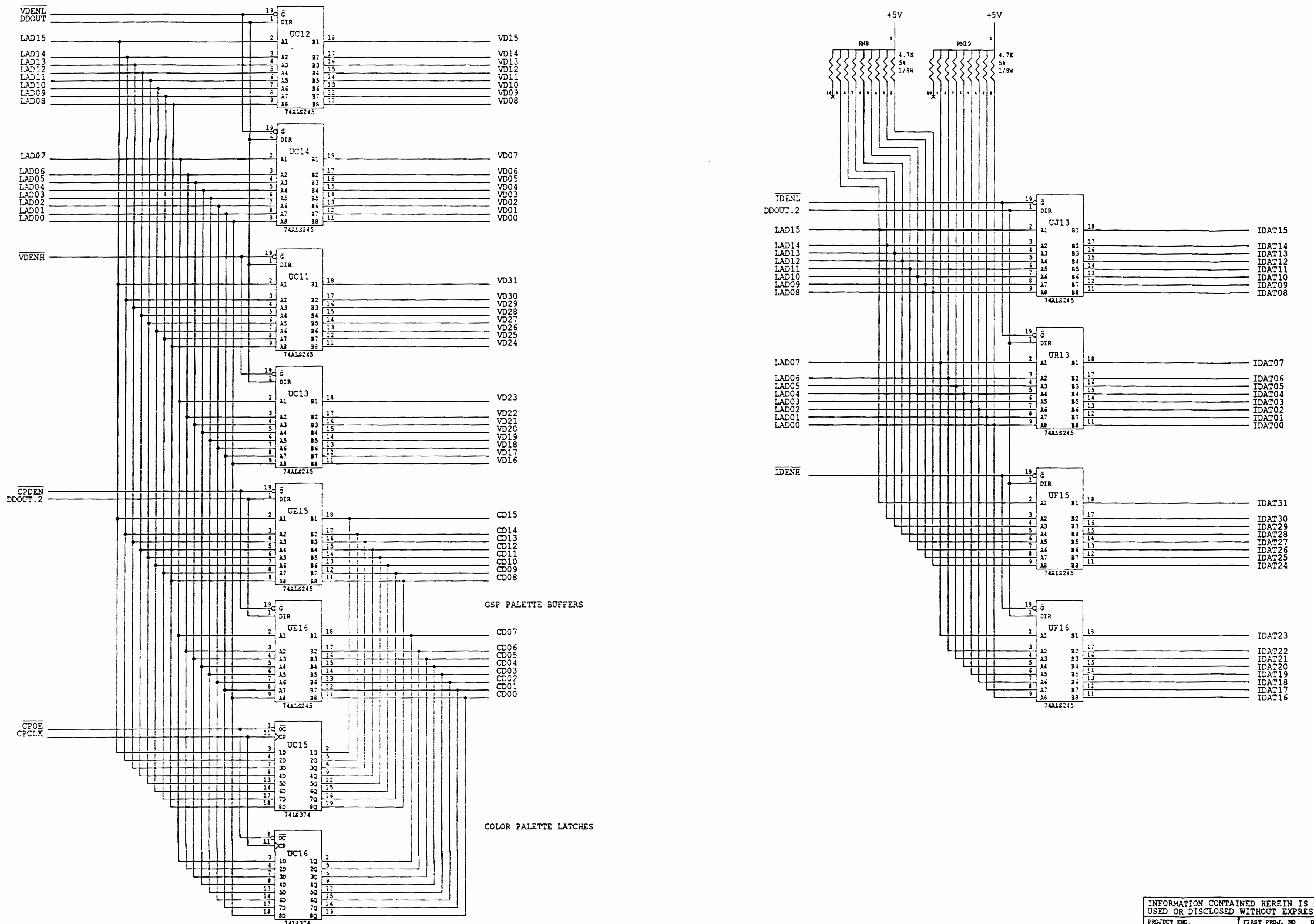
INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.

PROJECT ENG. REM	FIRST PROJ. NO 40023 DATE 09DEC92	WILLIAMS ELECTRONICS AND GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
DWN. BY REM DATE	FIRST USEAGE A-14816 DATE 09DEC92	TITLE
CHECKED DATE	CURRENT PROJECT 40023 DATE 09DEC92	ADDRESS GENERATION/BUFFERS
APPROVED DATE	SHEET 03 OF 22	PART NO. 16-9423 REV. -



CPU BOARD
Sheet 4 of 22

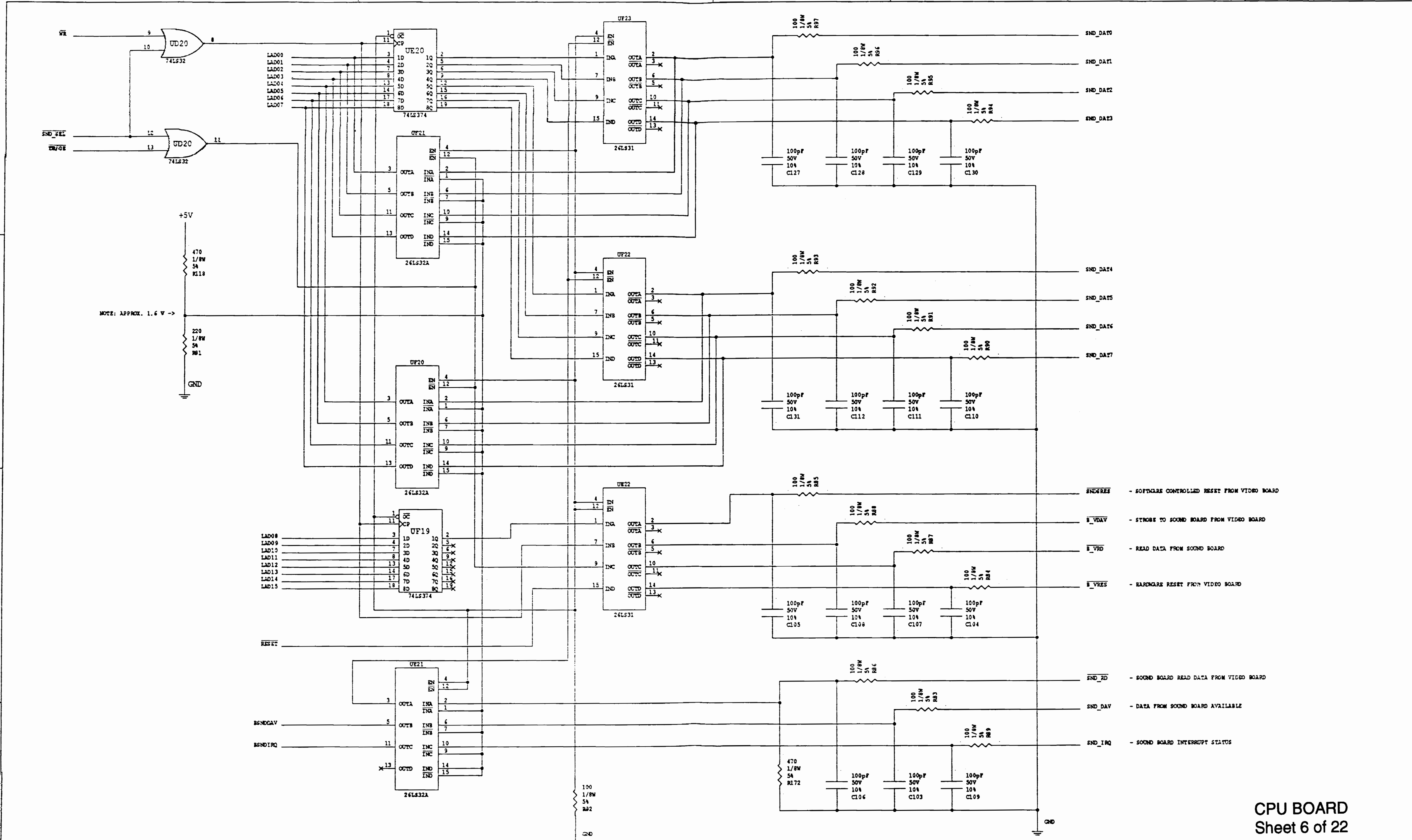
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DWN. BY REM DATE	FIRST USEAGE A-14186 DATE 09DEC92	TITLE SYSTEM MEMORY
CHECKED DATE	CURRENT PROJECT 40023 DATE 09DEC92	
APPROVED DATE	SHEET 04 OF 22	PART NO. 16-9423 REV. -



CPU BOARD
Sheet 5 of 22

INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.

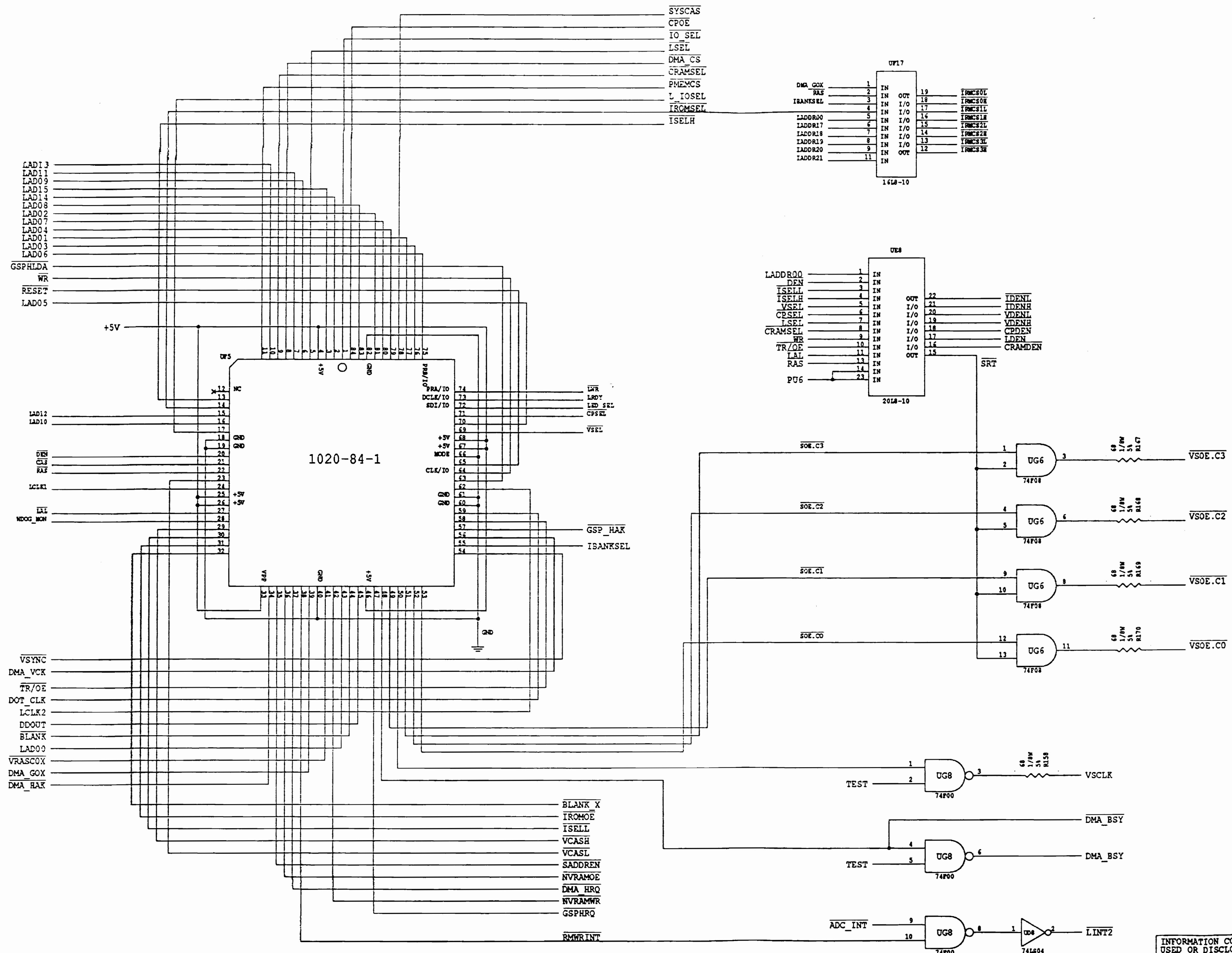
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DWN. BY REM DATE	FIRST USAGE A-14816 DATE 09DEC92	TITLE IMAGE/VIDEO MEMORY DATA BUFFERS
CHECKED DATE	CURRENT PROJECT 40023 DATE 09DEC92	
APPROVED DATE	SHEET 05 OF 22	PART NO. 16-9423 REV. -



CPU BOARD
Sheet 6 of 22

PROJECT ENG. REM		FIRST PROJ. NO 40023 / DATE 09DEC92	WILLIAMS ELECTRONICS AND GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
DWN. BY REM	DATE	FIRST USEAGE A-14816 / DATE 09DEC92	TITLE SOUND INTERFACE
CHECKED	DATE	CURRENT PROJECT 40023 / DATE 09DEC92	
APPROVED	DATE	SHEET 06 OF 22	PART NO. 16-9423 / REV. -

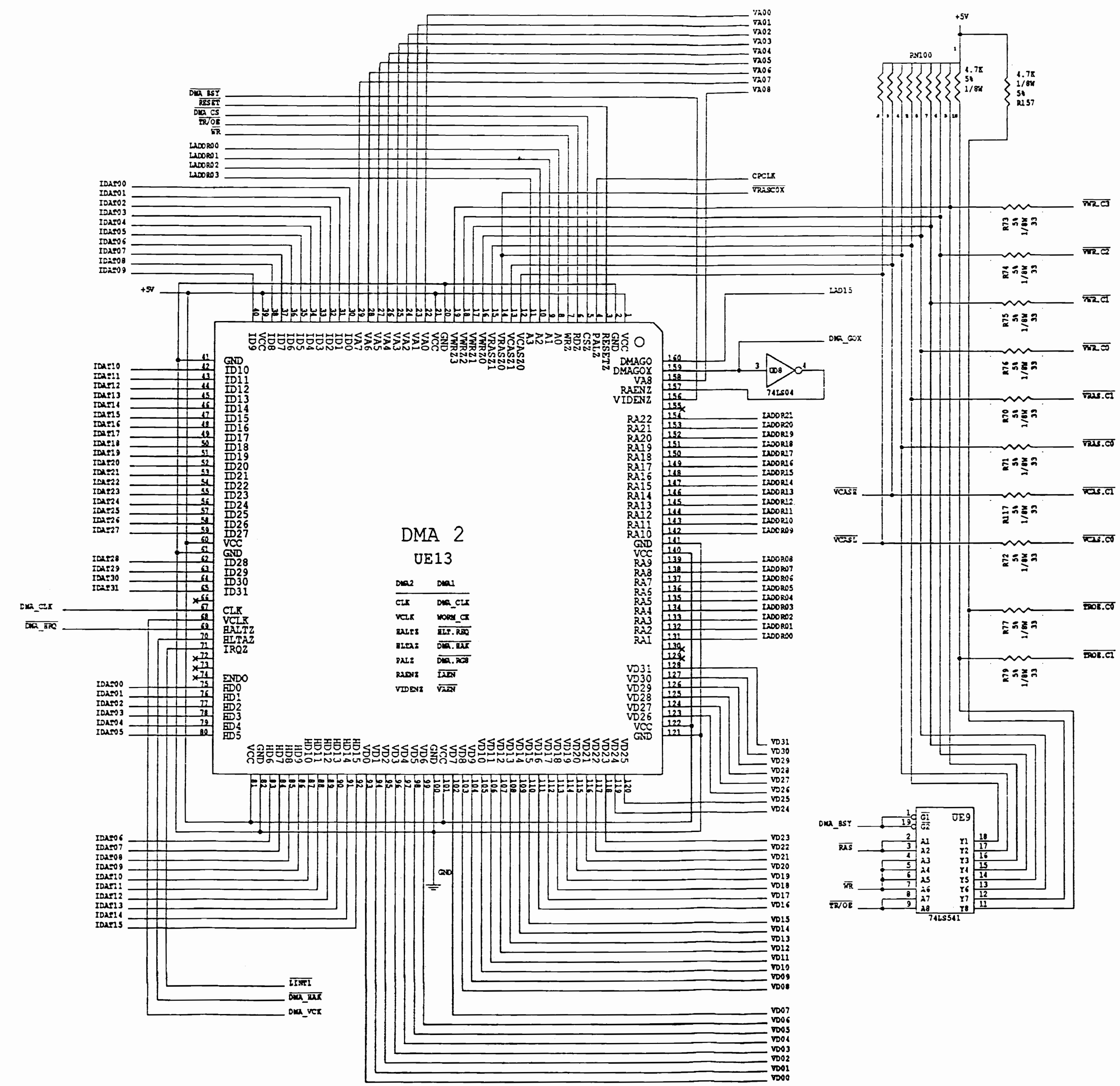
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CPU BOARD
Sheet 7 of 22

INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.

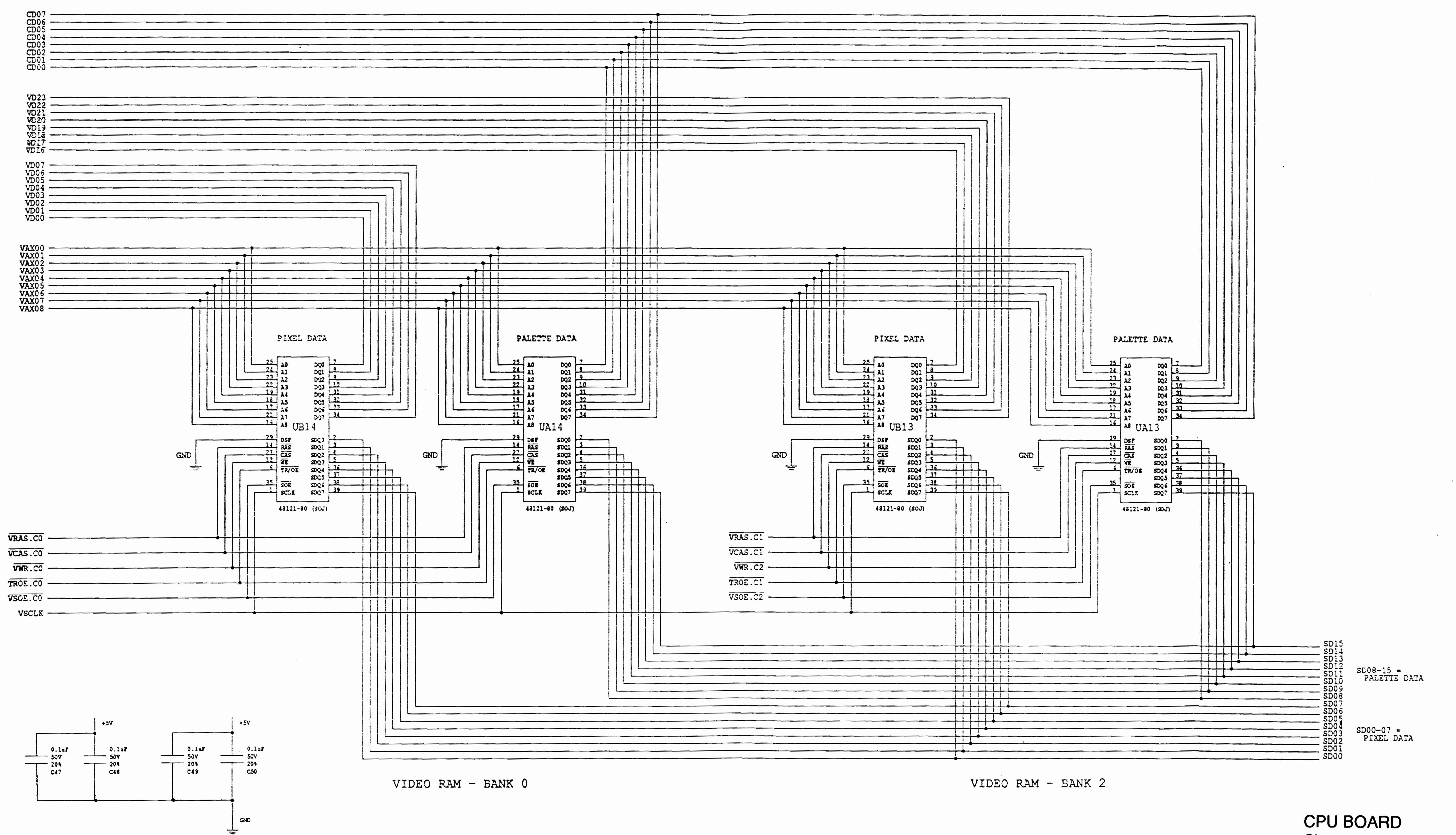
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DWN. BY REM DATE	FIRST USAGE A-14816 DATE 09DEC92	TITLE FPGA
CHECKED DATE	CURRENT PROJECT 40023 DATE 09DEC92	
APPROVED DATE	SHEET 07 OF 22	PART NO. 16-9423 REV. -



CPU BOARD
Sheet 8 of 22

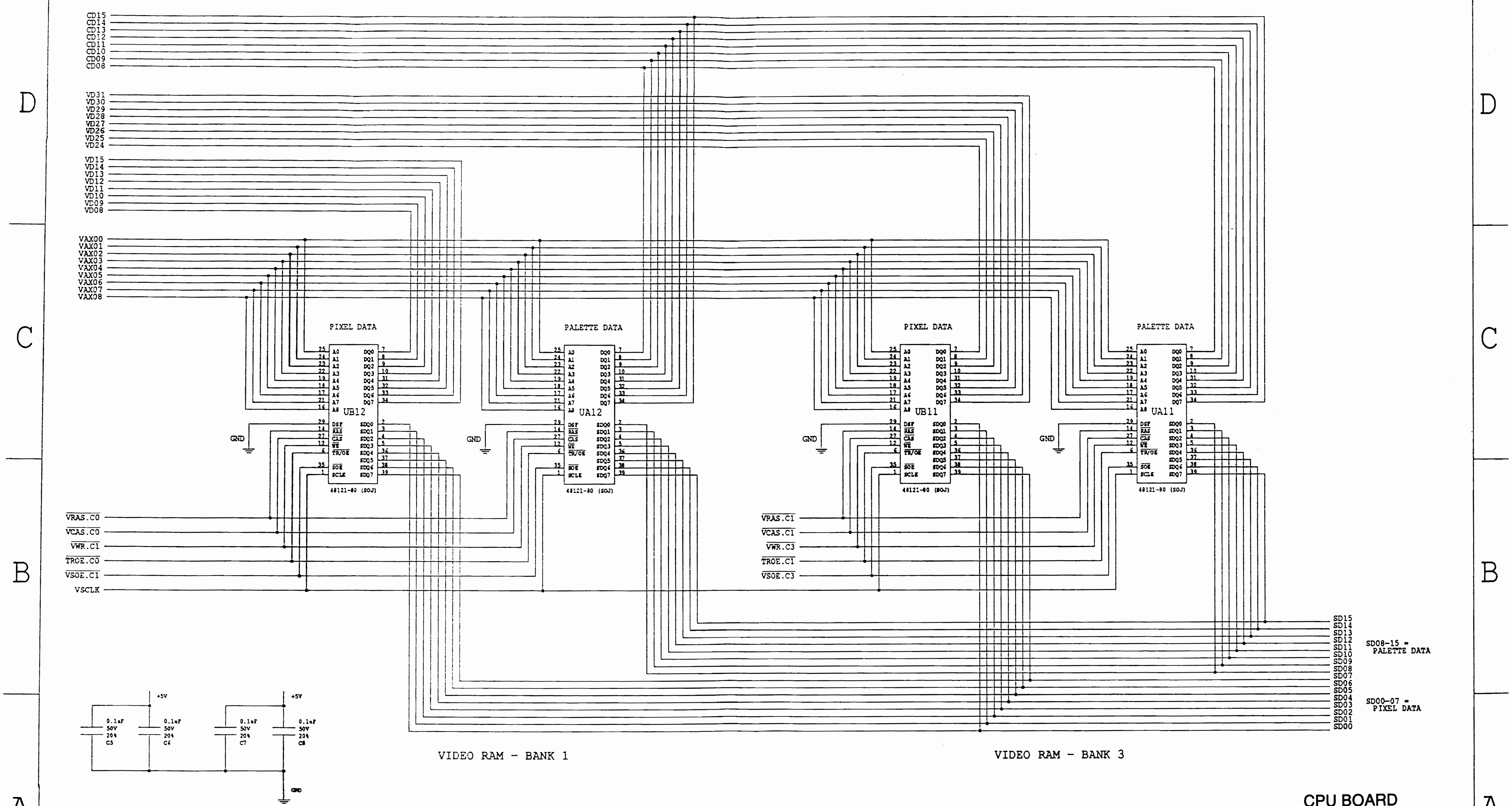
INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.

PROJECT ENG. REM	FIRST PROJ. NO 40023 DATE 09DEC92	WILLIAMS ELECTRONICS AND GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
DWN. BY REM DATE	FIRST USEAGE A-14816 DATE 09DEC92	TITLE DMA
CHECKED DATE	CURRENT PROJECT 40023 DATE 09DEC92	
APPROVED DATE	SHEET 08 OF 22	PART NO. 16-9423 REV. -



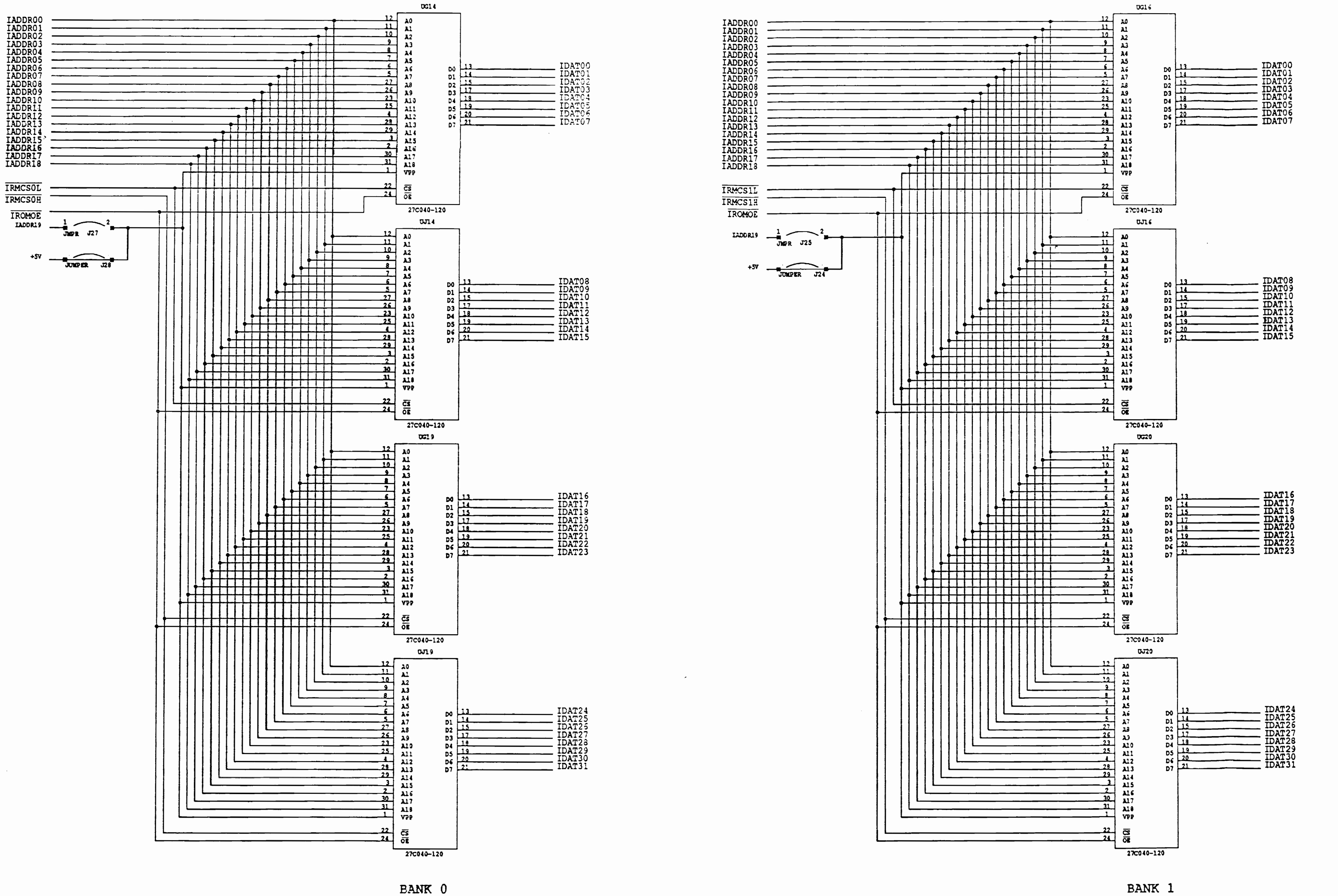
CPU BOARD
Sheet 9 of 22

PROJECT ENG. REM	FIRST PROJ. NO 40023 DATE 09DEC92	WILLIAMS ELECTRONICS AND GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
DWN. BY REM DATE	FIRST USEAGE A-14816 DATE 09DEC92	
CHECKED DATE	CURRENT PROJECT 40023 DATE 09DEC92	TITLE VIDEO RAM BANK 0/BANK 2
APPROVED DATE	SHEET 09 OF 22	PART NO. 16-9423 REV. -



CPU BOARD
Sheet 10 of 22

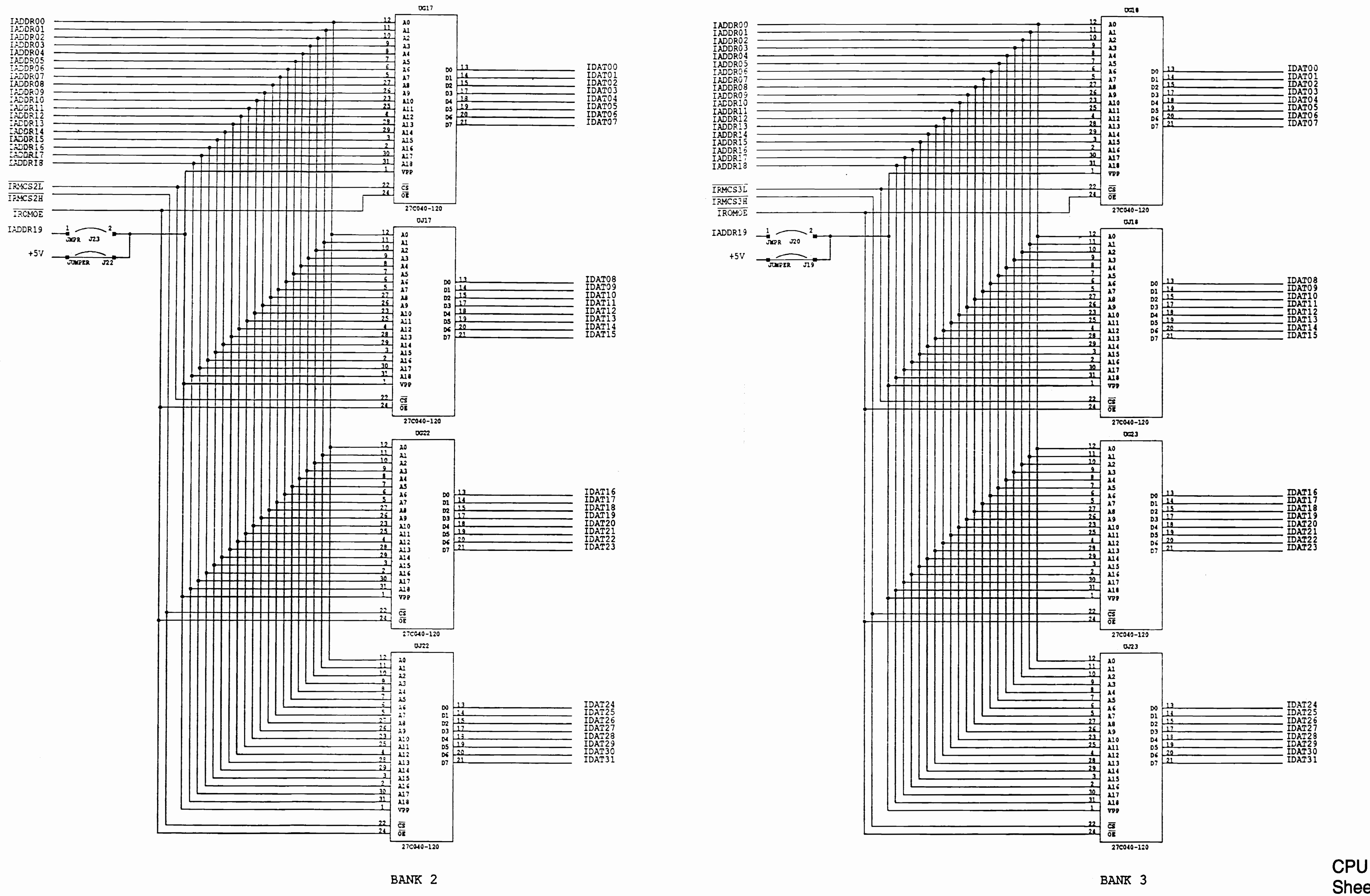
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DWN. BY REM DATE	FIRST USAGE A-14816 DATE 09DEC92	TITLE VIDEO RAM BANK 1/BANK 3
CHECKED DATE	CURRENT PROJECT 40023 DATE 09DEC92	
APPROVED DATE	SHEET 10 OF 22	PART NO. 16-9423 REV. -



CPU BOARD
Sheet 11 of 22

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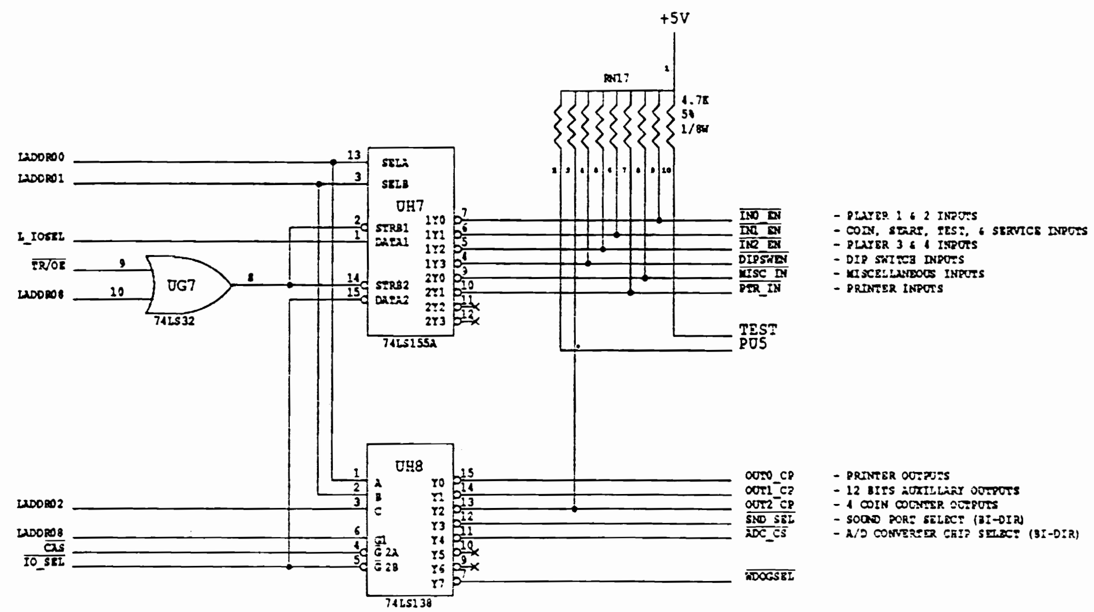
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DWN. BY REM DATE	FIRST USAGE A-14816 DATE 09DEC92	TITLE IMAGE ROM BANK 0/BANK 1
CHECKED DATE	CURRENT PROJECT 40023 DATE 09DEC92	
APPROVED DATE	SHEET 11 OF 22	PART NO. 16-9423 REV. -



CPU BOARD
Sheet 12 of 22

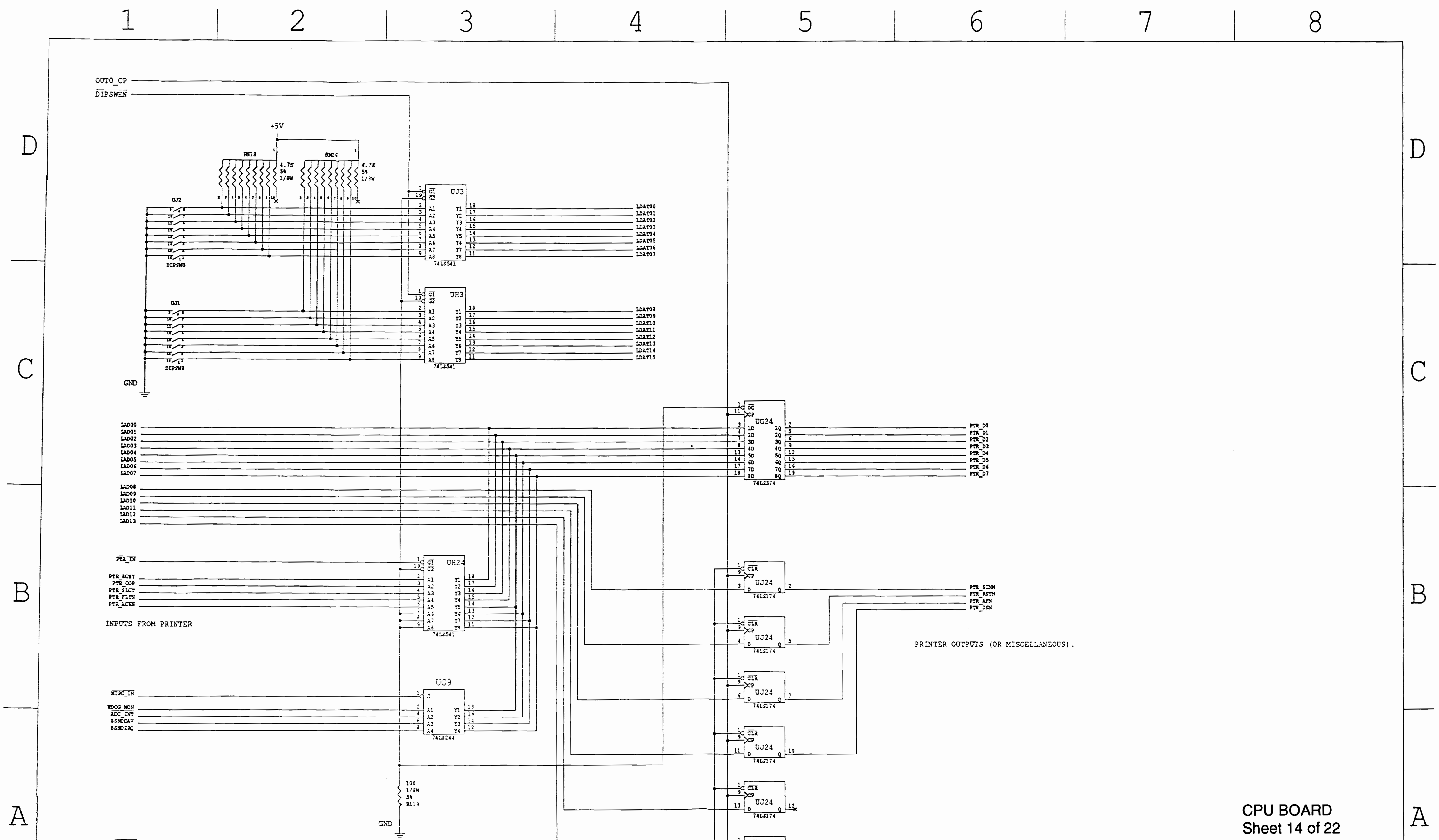
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PROJECT ENG. REM	FIRST PROJ. NO 40023 DATE 09DEC92	WILLIAMS ELECTRONICS AND GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
DWN. BY REM DATE	FIRST CHANGE A-14816 DATE 09DEC92	TITLE IMAGE ROM BANK 2/BANK 3
CHECKED DATE	CURRENT PROJECT 40023 DATE 09DEC92	
APPROVED DATE	SHEET 12 OF 22	PART NO. 16-9423 REV. -



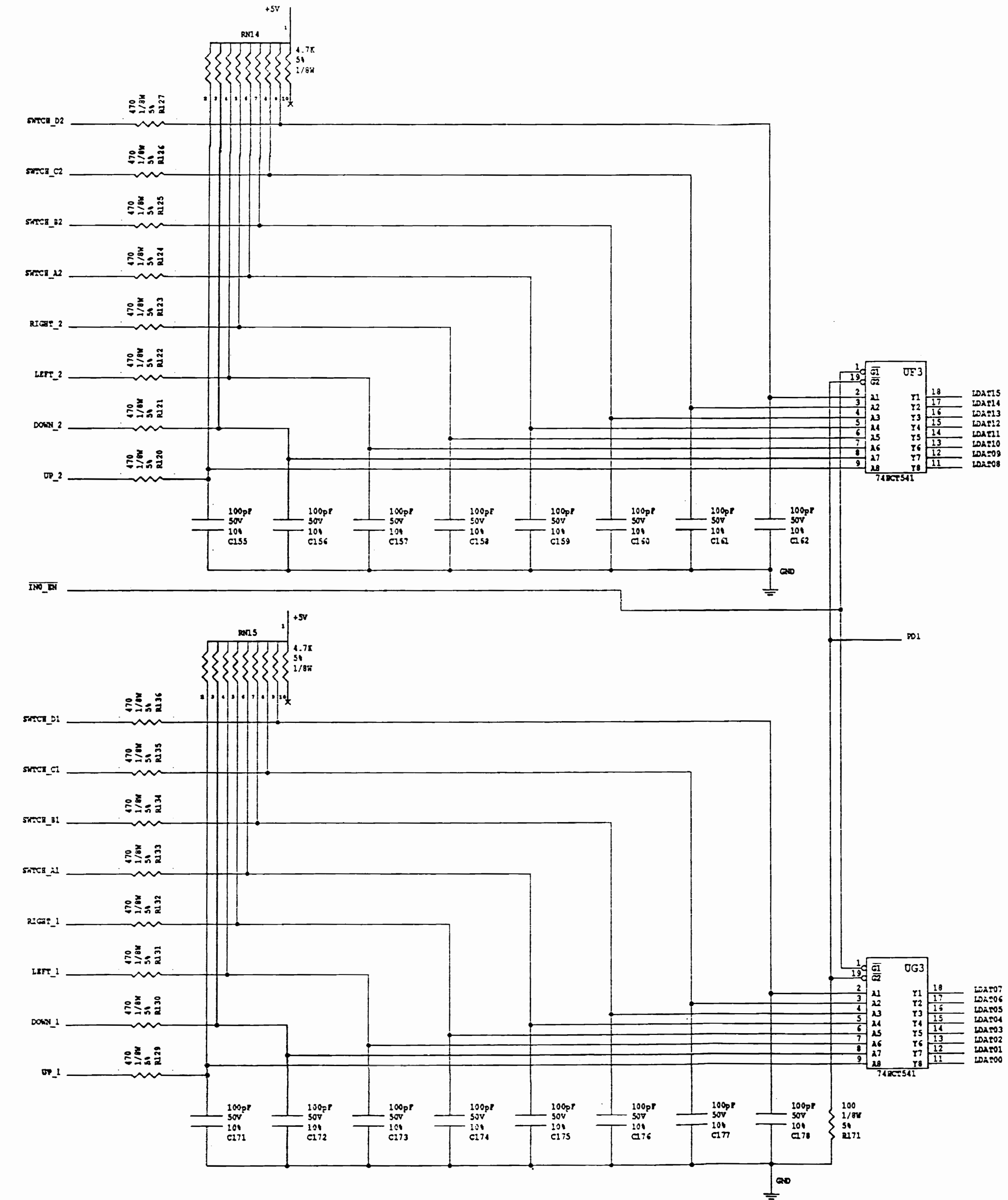
CPU BOARD
Sheet 13 of 22

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DWN. BY REM DATE	FIRST USAGE A-14816 DATE 09DEC92	
CHECKED DATE	CURRENT PROJECT 40023 DATE 09DEC92	TITLE I/O DECODING
APPROVED DATE	SHEET 13 OF 22	PART NO. 16-9423 REV. -



CPU BOARD
Sheet 14 of 22

PROJECT ENG. REM	FIRST PROJ. NO 40023 DATE 09DEC92	WILLIAMS ELECTRONICS AND GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.	
DWN. BY REM DATE	FIRST USEAGE A-14816 DATE 09DEC92		
CHECKED DATE	CURRENT PROJECT 40023 DATE 09DEC92	TITLE MISC. I/O AND DIP SWITCH	
APPROVED DATE	SHEET 14 OF 22	PART NO. 16-9423	REV. -

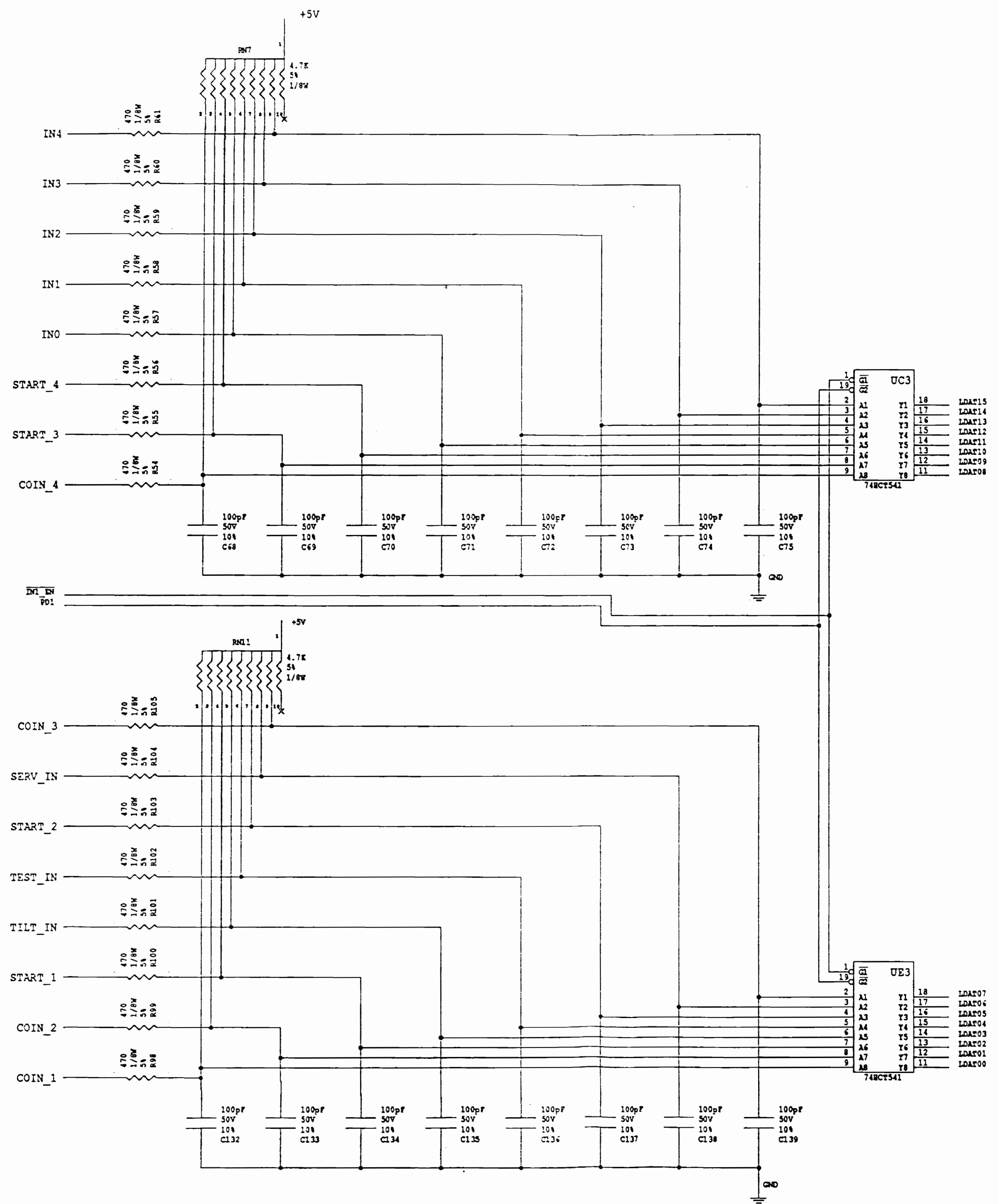


CPU BOARD
Sheet 15 of 22

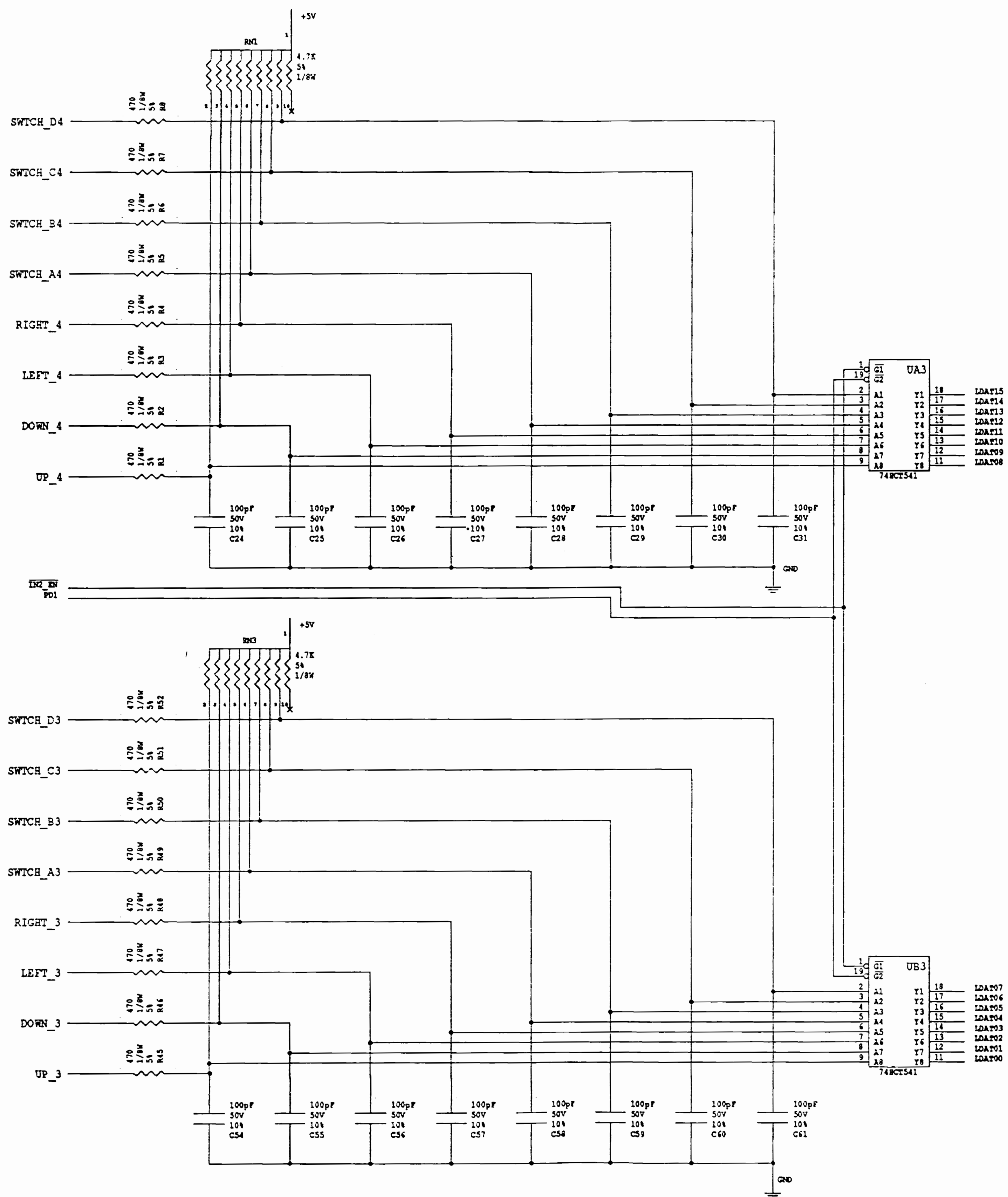
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DWN. BY REM	DATE	FIRST USAGE A-14816 / DATE 09DEC92	
CHECKED	DATE	CURRENT PROJECT 40023 / DATE 09DEC92	TITLE PLAYER 1/PLAYER 2 INPUTS
APPROVED	DATE	SHEET 15 OF 22	PART NO. 16-9423 / REV. -

CPU BOARD
Sheet 16 of 22

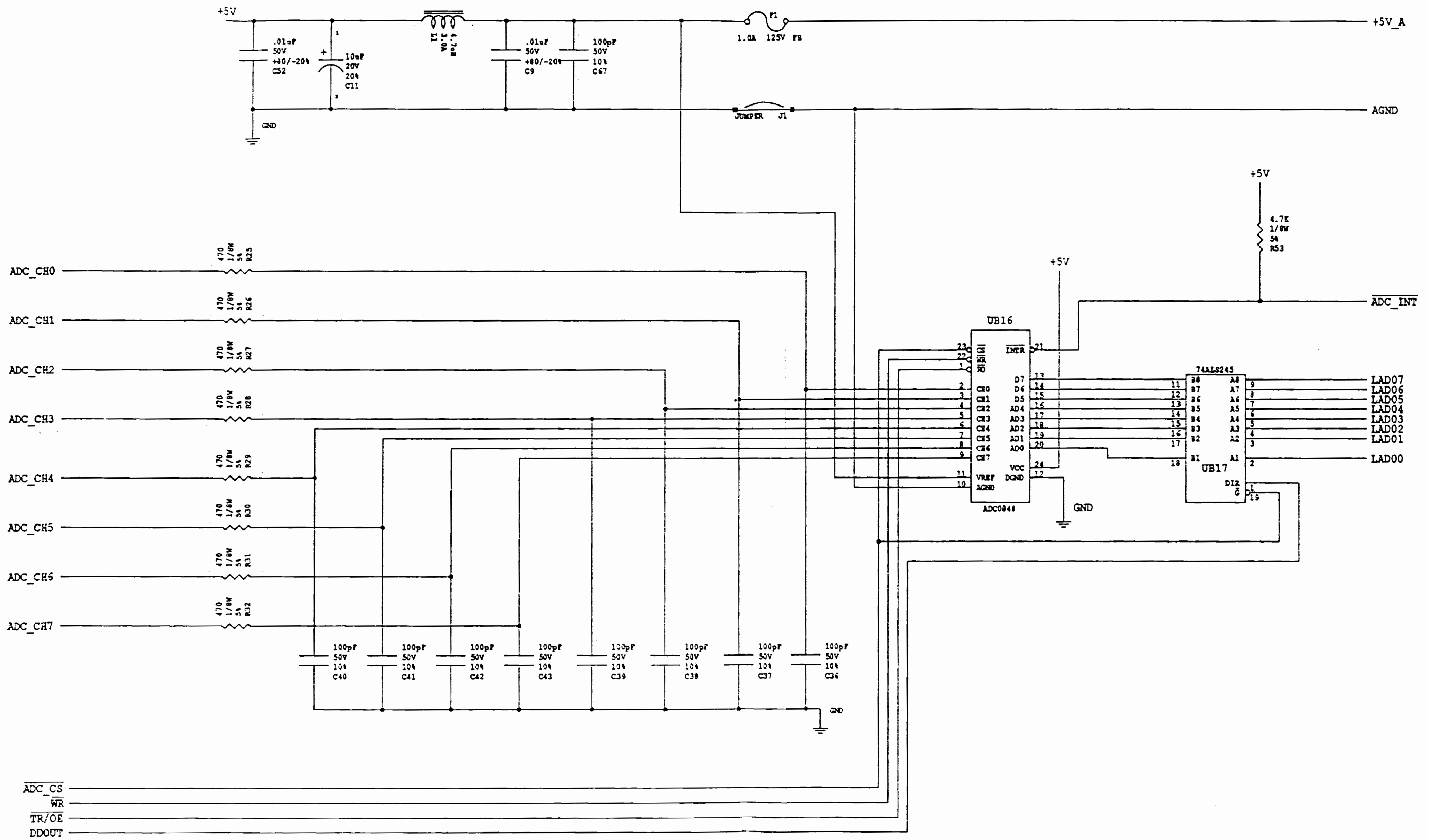


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DWN. BY REM DATE	FIRST USEAGE A-14816 DATE 09DEC92	TITLE EXTRA INPUTS/COIN/START
CHECKED DATE	CURRENT PROJECT 40023 DATE 09DEC92	
APPROVED DATE	SHEET 16 OF 22	PART NO. 16-9423 REV. -



CPU BOARD
Sheet 17 of 22

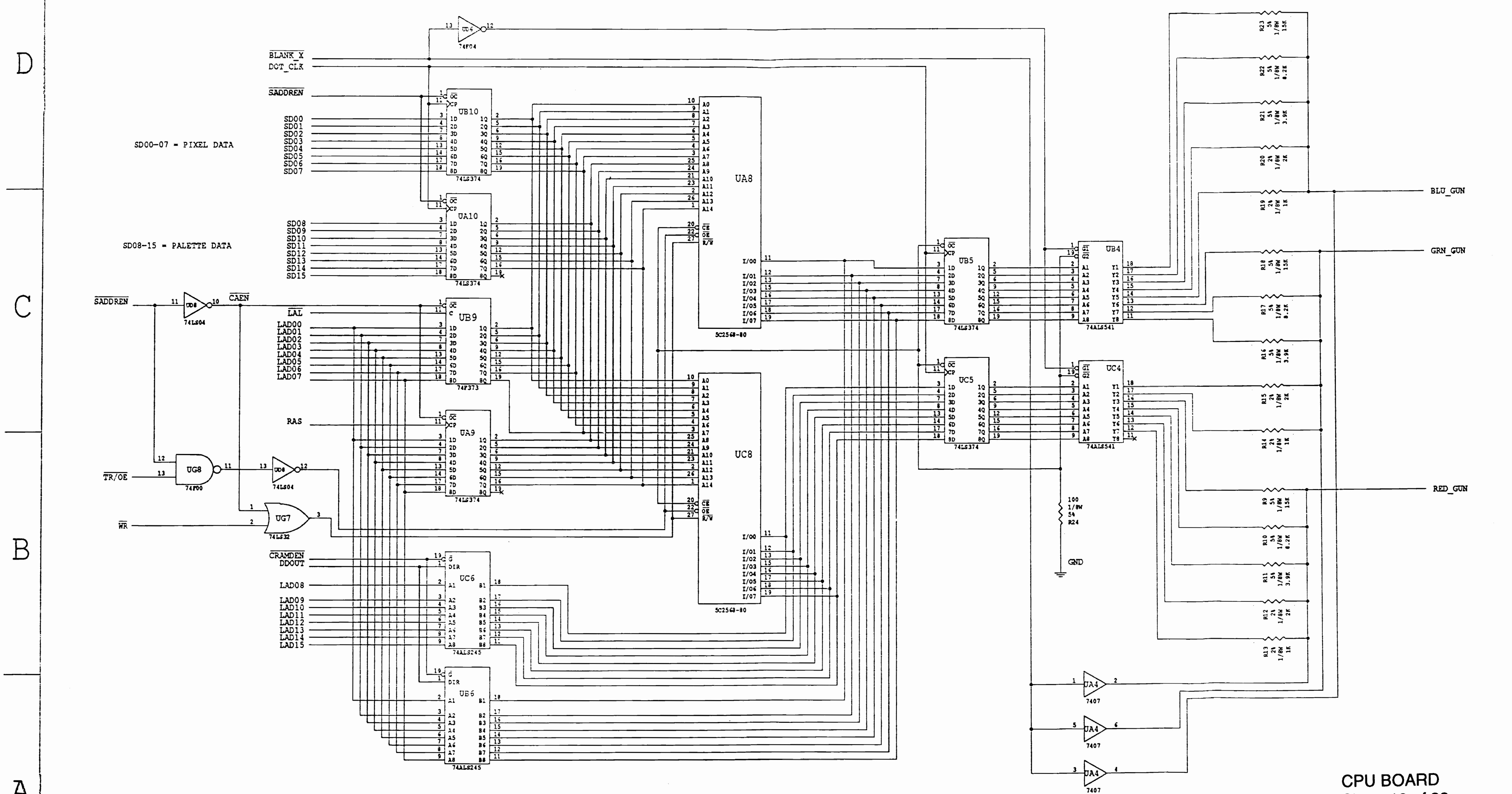
PROJECT ENG. REM	FIRST PROJ. NO 40023 DATE 09DEC92	WILLIAMS ELECTRONICS AND GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
DWN. BY REM DATE	FIRST USAGE A-14816 DATE 09DEC92	
CHECKED DATE	CURRENT PROJECT 40023 DATE 09DEC92	TITLE PLAYER 3/PLAYER 4 INPUTS
APPROVED DATE	SHEET 17 OF 22	PART NO. 16-9423 REV. -



CPU BOARD
Sheet 18 of 22

INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.

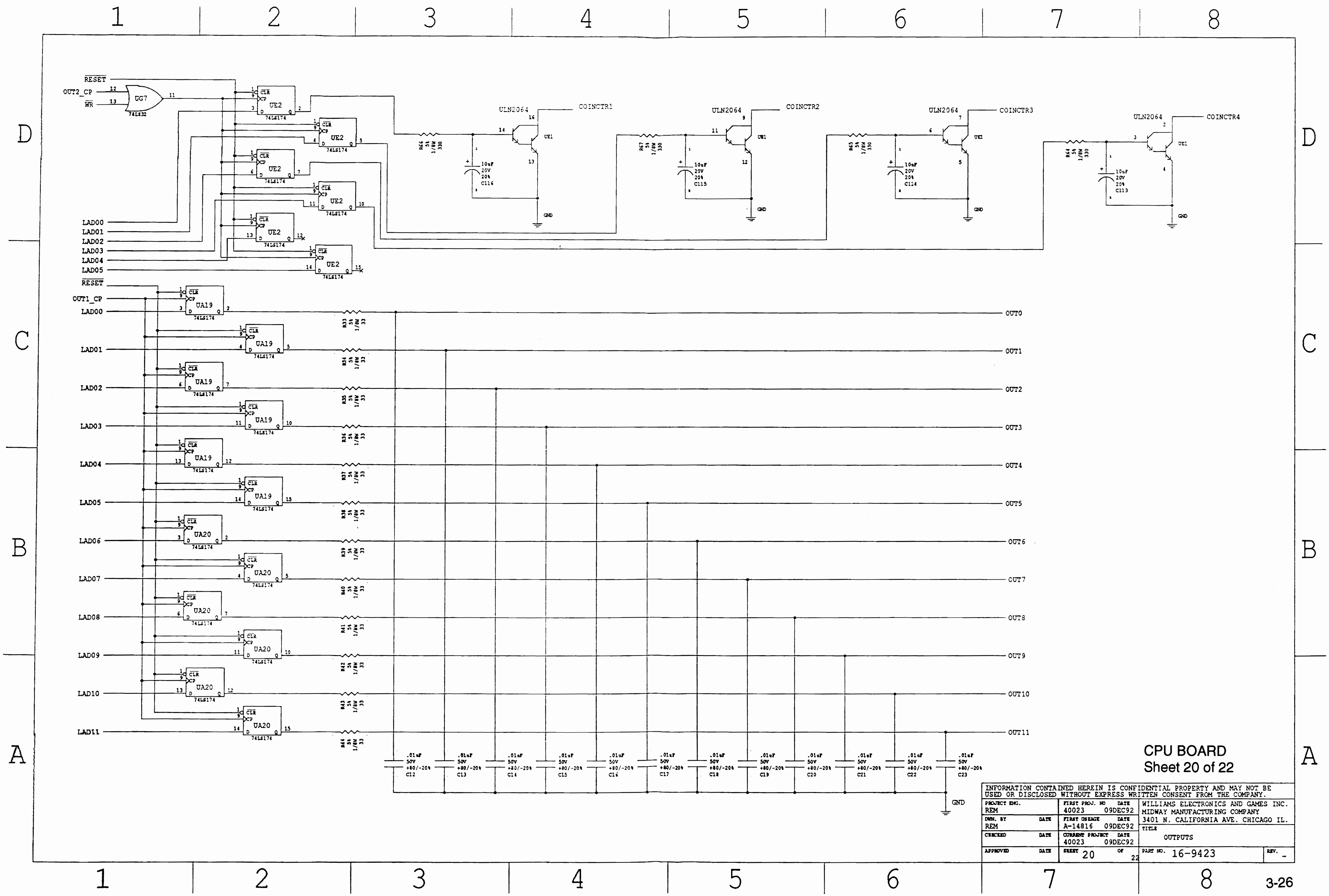
PROJECT ENG. REM	FIRST PROJ. NO 40023 DATE 09DEC92	WILLIAMS ELECTRONICS AND GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.	
DWN. BY REM DATE	FIRST DEBUG A-14816 DATE 09DEC92	TITLE A/D	
CHECKED DATE	CURRENT PROJECT 40023 DATE 09DEC92		
APPROVED DATE	SHEET 18 OF 22	PART NO. 16-9423	REV. -



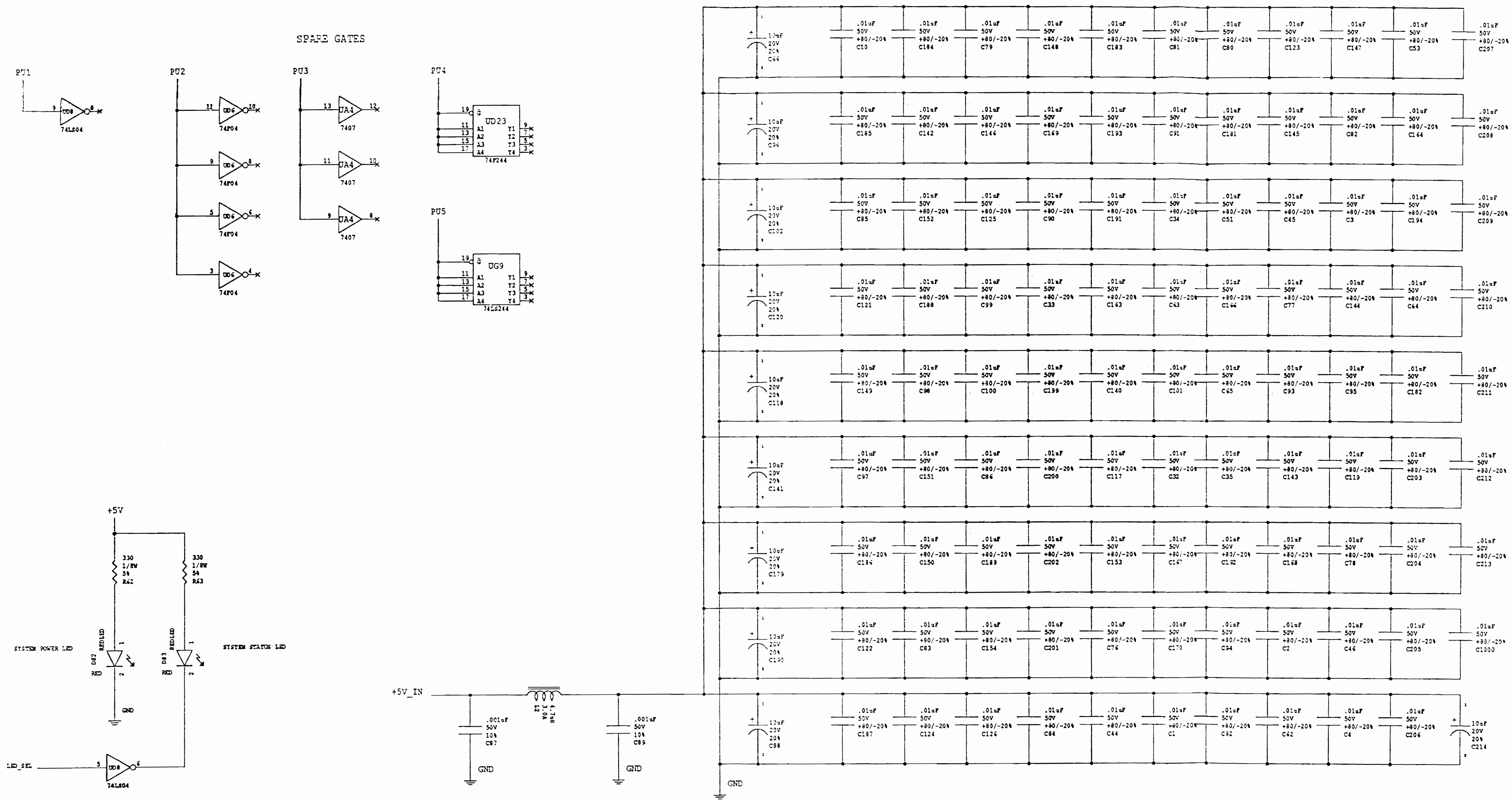
CPU BOARD
Sheet 19 of 22

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PROJECT ENG. REM	FIRST PROJ. NO 40023 DATE 09DEC92	WILLIAMS ELECTRONICS AND GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
DWN. BY REM DATE	FIRST USAGE A-14816 DATE 09DEC92	TITLE RAMDAC
CHECKED DATE	CURRENT PROJECT 40023 DATE 09DEC92	
APPROVED DATE	SHEET 19 OF	PART NO. 16-9423 REV. _

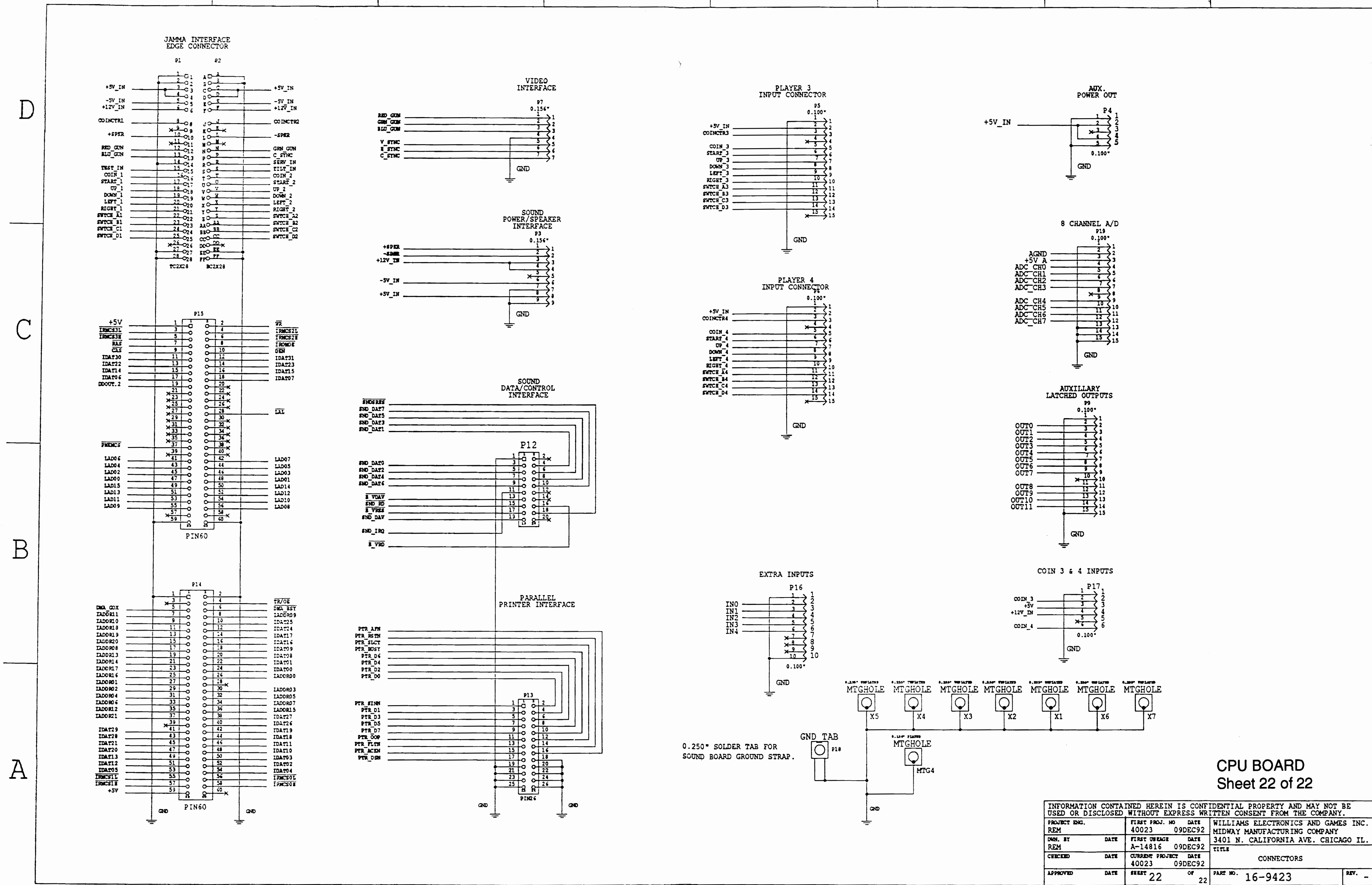


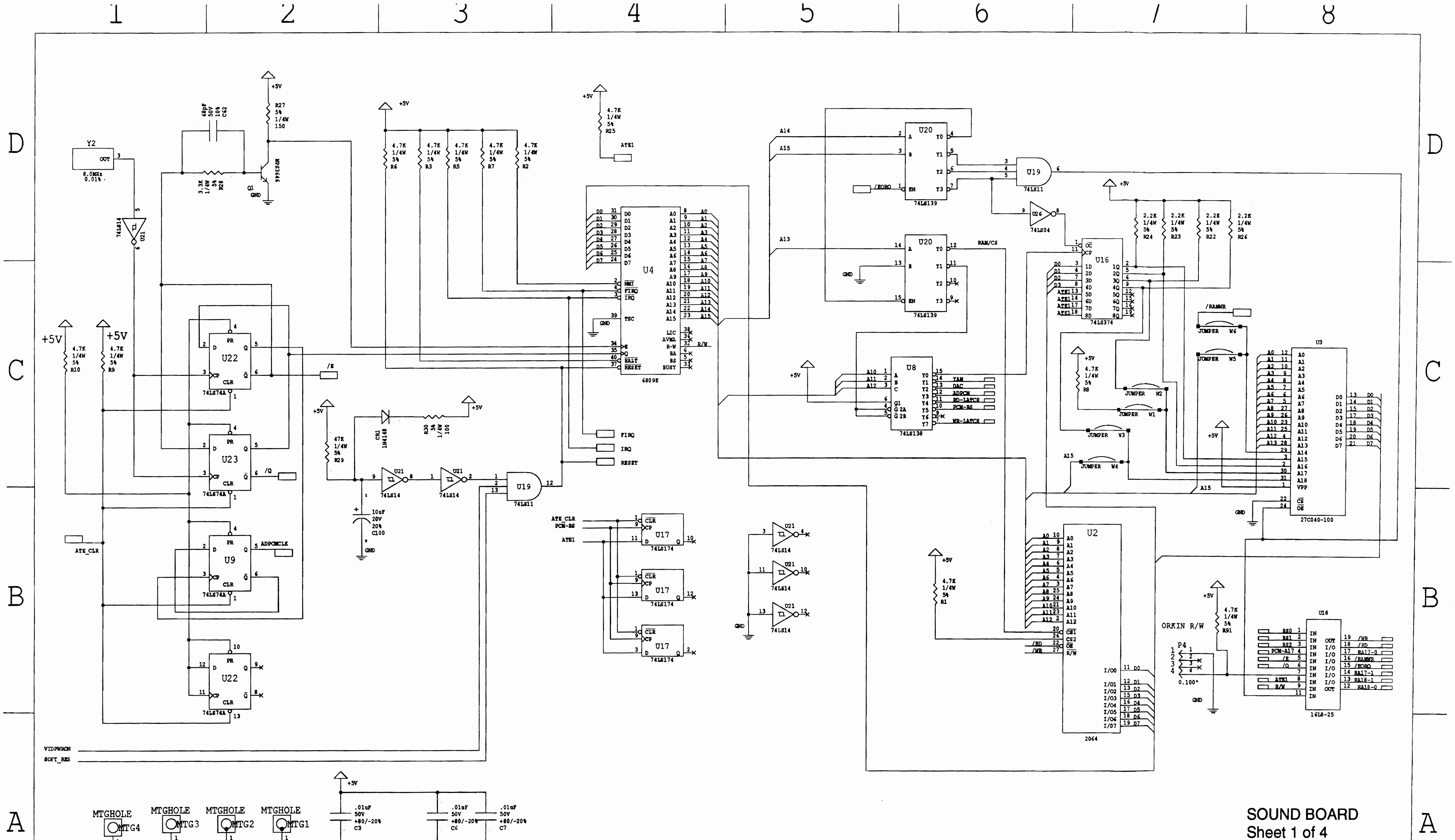
RESET
OUT2_CP
WR
UG7
74LS32
UE2
74LS174
CLR
CP
D
Q
LAD00
LAD01
LAD02
LAD03
LAD04
LAD05
LAD06
LAD07
LAD08
LAD09
LAD10
LAD11
OUT1_CP
UA19
UA20
ULN2064
UE1
COINCTR1
COINCTR2
COINCTR3
COINCTR4
R66
R67
R65
R64
5%
1/8W
330
10uF
20V
20%
C116
C115
C114
C113
GND
OUT0
OUT1
OUT2
OUT3
OUT4
OUT5
OUT6
OUT7
OUT8
OUT9
OUT10
OUT11
.01uF
50V
+80/-20%
C12
C13
C14
C15
C16
C17
C18
C19
C20
C21
C22
C23
CPU BOARD
Sheet 20 of 22
INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.
PROJECT ENG. REM
FIRST PROJ. NO 40023 DATE 09DEC92
WILLIAMS ELECTRONICS AND GAMES INC.
MIDWAY MANUFACTURING COMPANY
3401 N. CALIFORNIA AVE. CHICAGO IL.
DWN. BY REM
FIRST USEAGE A-14816 DATE 09DEC92
CHECKED
CURRENT PROJECT 40023 DATE 09DEC92
TITLE OUTPUTS
APPROVED
SHEET 20 OF 22
PART NO. 16-9423
REV. -



CPU BOARD
Sheet 21 of 22

PROJECT ENG. REM	FIRST PROJ. NO 40023 DATE 09DEC92	WILLIAMS ELECTRONICS AND GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
DWN. BY REM DATE	FIRST USEAGE A-14816 DATE 09DEC92	TITLE POWER
CHECKED DATE	CURRENT PROJECT 40023 DATE 09DEC92	
APPROVED DATE	SHEET 21 OF 22	PART NO. 16-9423 REV. -


JAMMA INTERFACE
EDGE CONNECTOR
P1
P2
P15
PIN60
P14
PIN60
VIDEO
INTERFACE
P7
0.156"
SOUND
POWER/SPEAKER
INTERFACE
P3
0.156"
SOUND
DATA/CONTROL
INTERFACE
P12
PARALLEL
PRINTER INTERFACE
P13
PIN26
PLAYER 3
INPUT CONNECTOR
P5
0.100"
PLAYER 4
INPUT CONNECTOR
0.100"
EXTRA INPUTS
P16
0.100"
AUX.
POWER OUT
P4
0.100"
8 CHANNEL A/D
P19
0.100"
AUXILLARY
LATCHED OUTPUTS
P9
0.100"
COIN 3 & 4 INPUTS
P17
0.100"
GND
MTGHOLE
GND_TAB
P18
MTG4
0.250" SOLDER TAB FOR
SOUND BOARD GROUND STRAP.
CPU BOARD
Sheet 22 of 22
INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.
PROJECT ENG. REM
FIRST PROJ. NO 40023 DATE 09DEC92
DWN. BY REM
FIRST USAGE A-14816 DATE 09DEC92
CHECKED
CURRENT PROJECT 40023 DATE 09DEC92
APPROVED
SHEET 22 OF 22
WILLIAMS ELECTRONICS AND GAMES INC.
MIDWAY MANUFACTURING COMPANY
3401 N. CALIFORNIA AVE. CHICAGO IL.
TITLE
CONNECTORS
PART NO. 16-9423
REV. -

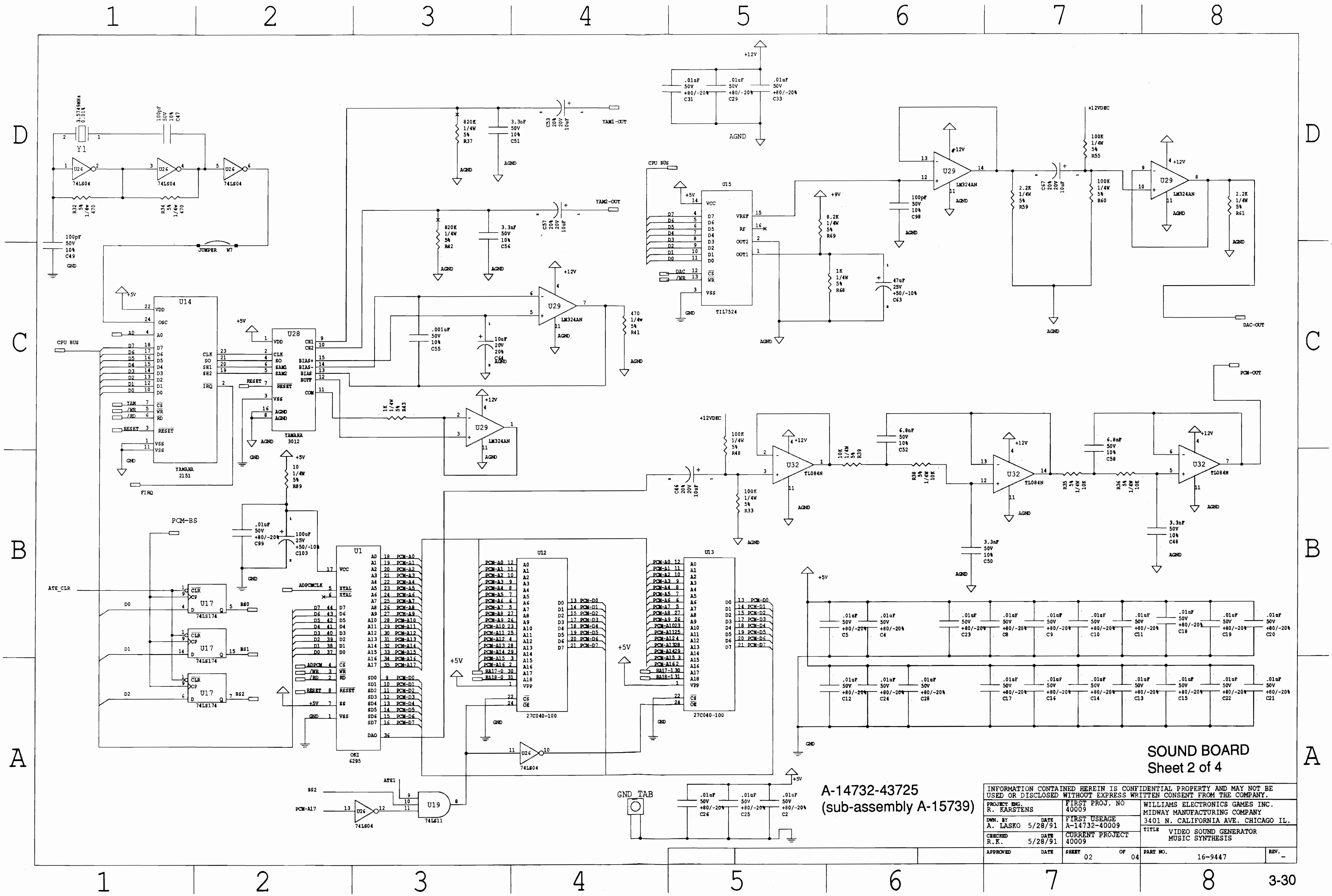


SOUND BOARD
Sheet 1 of 4

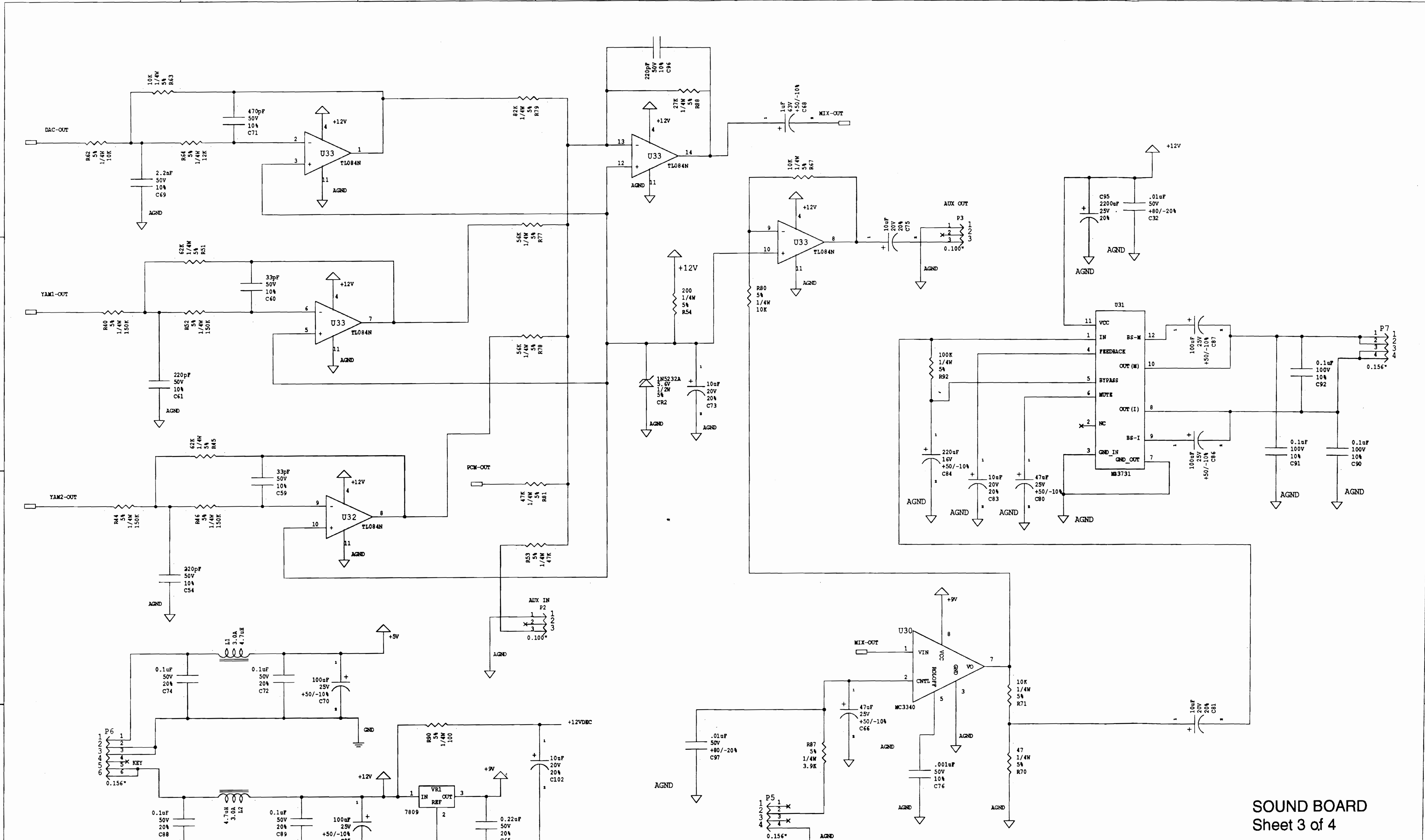
A-14732-43725
(sub-assembly A-15739)

INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.

PROJECT ENG. R. KARSTENS	FIRST PROJ. NO 40023	WILLIAMS ELECTRONICS GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
DWN. BY A. LASKO DATE 5/28/91	FIRST USEAGE a-14732-40023	TITLE VIDEO SOUND GENERATOR SPEECH SYSTHESIS
CHECKED R.K. DATE 5/28/91	CURRENT PROJECT 40023	
APPROVED DATE	SHEET 01 OF 04	PART NO. 16-9447 REV. _



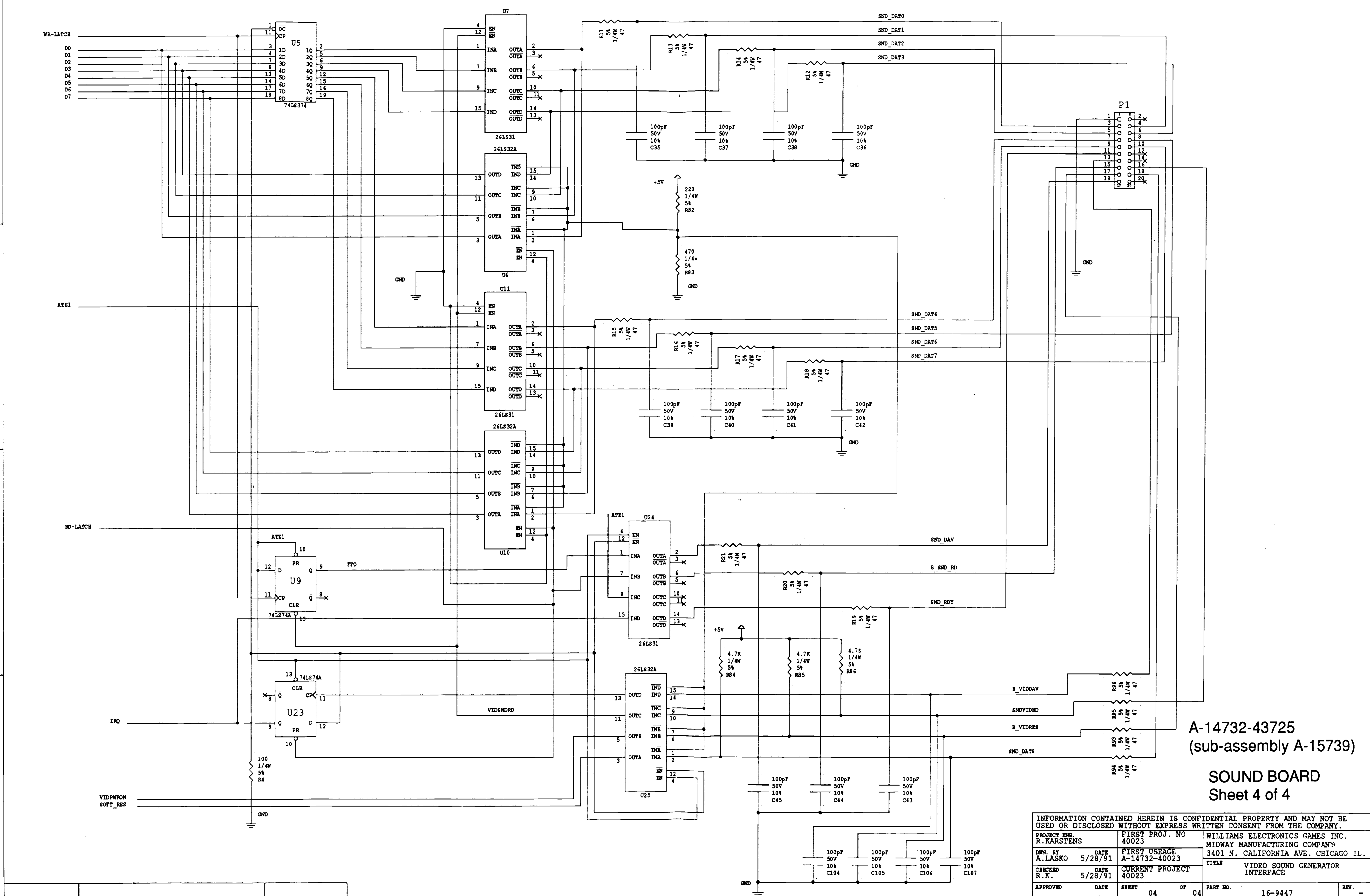
SOUND BOARD
Sheet 2 of 4
A-14732-43725
(sub-assembly A-15739)
INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.
PROJECT ENG. R. KARSTENS
FIRST PROJ. NO 40009
DWN. BY A. LASKO DATE 5/28/91
FIRST USEAGE A-14732-40009
CHECKED R.K. DATE 5/28/91
CURRENT PROJECT 40009
APPROVED DATE
SHEET 02 OF 04
WILLIAMS ELECTRONICS GAMES INC.
MIDWAY MANUFACTURING COMPANY
3401 N. CALIFORNIA AVE. CHICAGO IL.
TITLE VIDEO SOUND GENERATOR MUSIC SYNTHESIS
PART NO. 16-9447
REV. -
U14 YAMAHA 2151
U28 YAMAHA 3012
U15 TL7524
U1 OKI 6295
U12 27C040-100
U13 27C040-100
U17 74LS174
U26 74LS04
U19 74LS11
U29 LM324AN
U32 TL084N
Y1 3.5795MHz 0.01%
JUMPER W7
CPU BUS
YAM1-OUT
YAM2-OUT
DAC-OUT
PCM-OUT
PCM-BS
ATE_CLR
ADPCMCLK
FIRQ
GND_TAB
AGND
GND
+5V
+9V
+12V
+12VDEC



SOUND BOARD
Sheet 3 of 4

A-14732-43725
(sub-assembly A-15739)

INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.		
PROJECT ENG. R. KARSTENS	FIRST PROJ. NO 40023	WILLIAMS ELECTRONICS GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
DWN. BY A.LASKO DATE 5/28/91	FIRST USEAGE A-14732-40023	
CHECKED R.K. DATE 5/28/91	CURRENT PROJECT 40023	TITLE VIDEO SOUND GENERATOR AMPLIFIER
APPROVED DATE	SHEET 03 OF 04	PART NO. 16-9447 REV. -

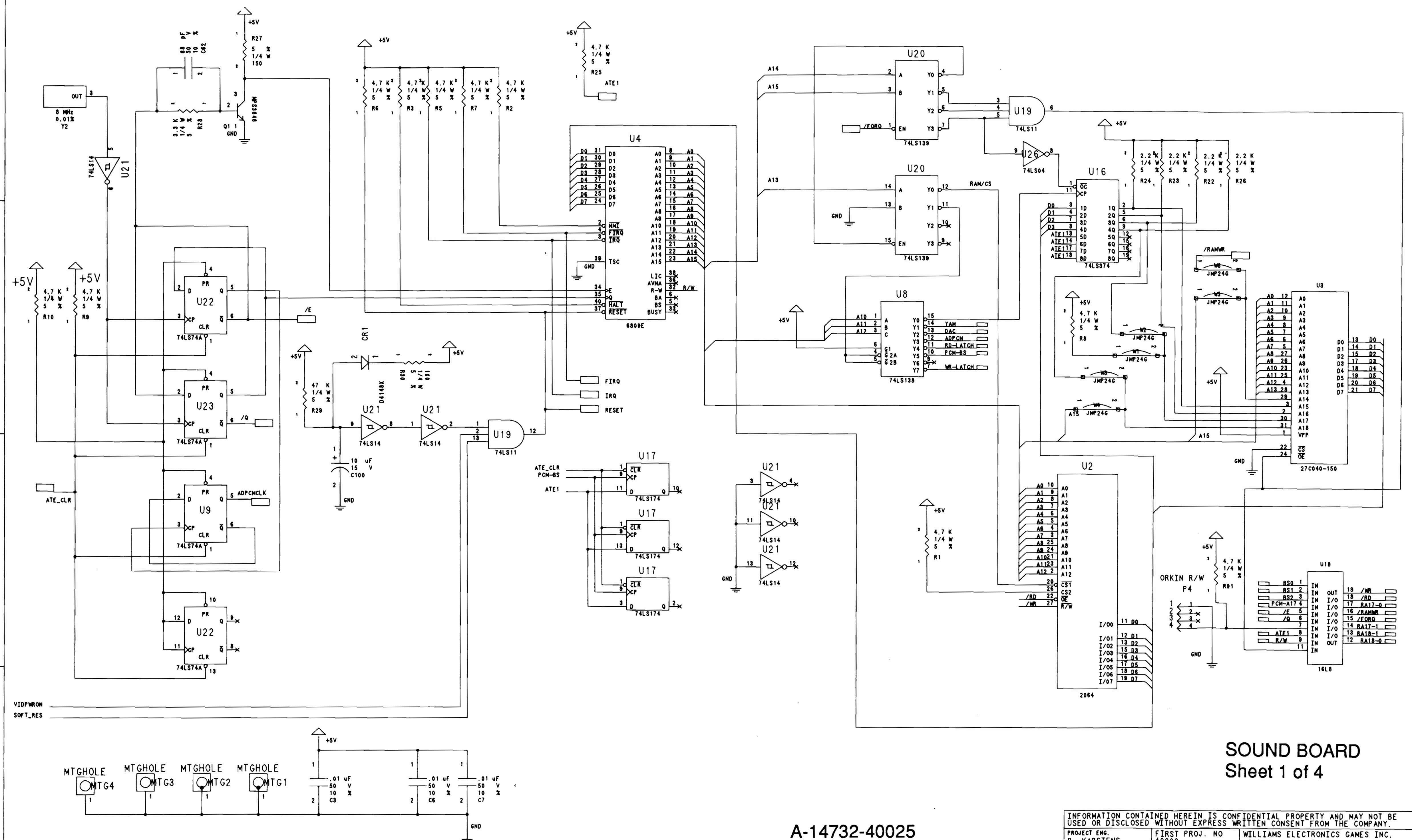


A-14732-43725
(sub-assembly A-15739)

SOUND BOARD
Sheet 4 of 4

INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.		
PROJECT ENG. R.KARSTENS	FIRST PROJ. NO 40023	WILLIAMS ELECTRONICS GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
DWN. BY A.LASKO DATE 5/28/91	FIRST USEAGE A-14732-40023	TITLE VIDEO SOUND GENERATOR INTERFACE
CHECKED R.K. DATE 5/28/91	CURRENT PROJECT 40023	
APPROVED DATE	SHEET 04 OF 04	PART NO. 16-9447 REV. -

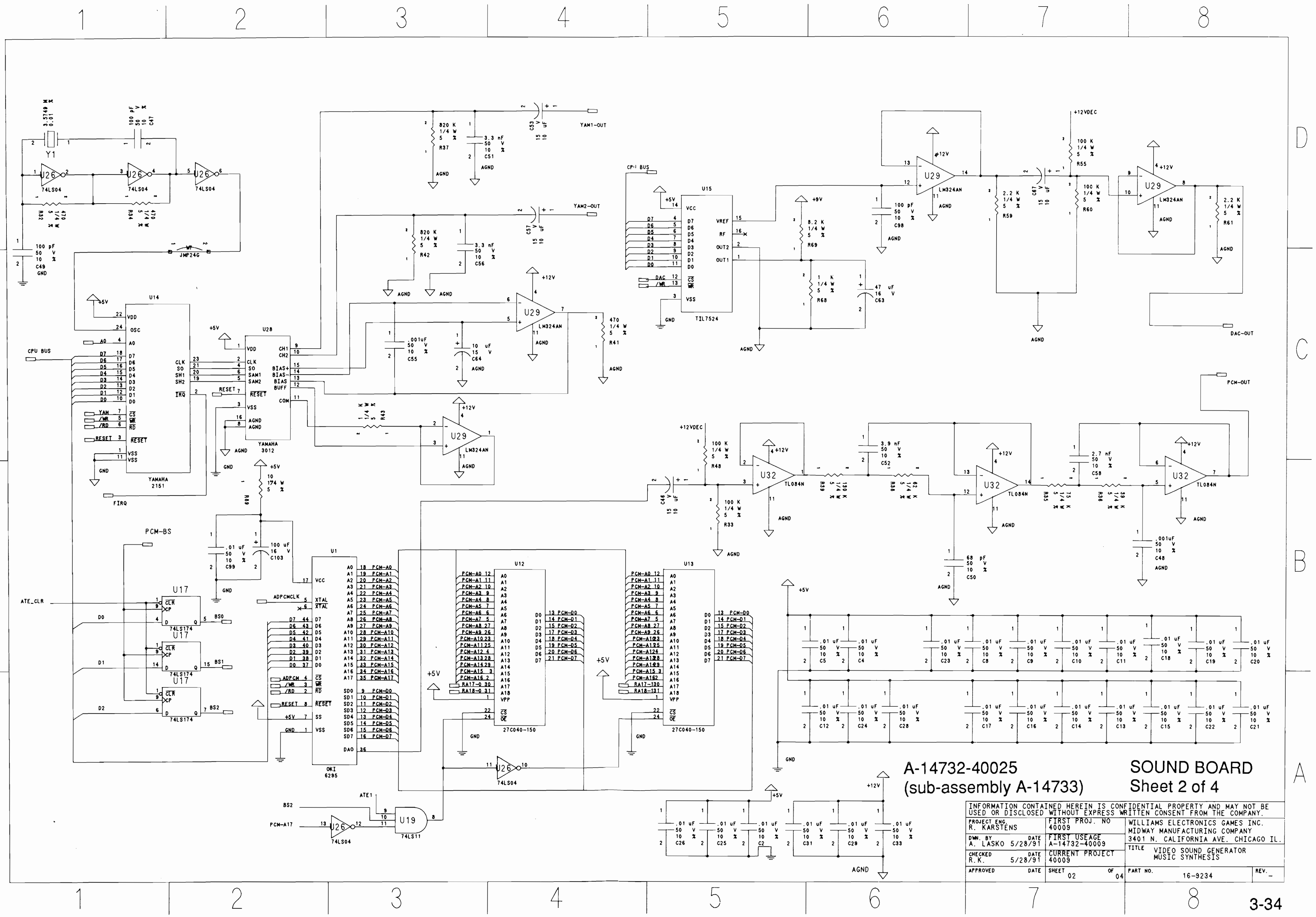
REV	DESC	
-	NDR 7-22-91	27317



SOUND BOARD
Sheet 1 of 4

A-14732-40025
(sub-assembly A-14733)

INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.		
PROJECT ENG. R. KARSTENS	FIRST PROJ. NO 40009	WILLIAMS ELECTRONICS GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
DWN. BY A. LASKO DATE 5/28/91	FIRST USEAGE A-14732-40009	TITLE VIDEO SOUND GENERATOR SPEECH SYSTHESIS
CHECKED R.K. DATE 5/28/91	CURRENT PROJECT 40009	
APPROVED DATE	SHEET 01 OF 04	PART NO. 16-9234 REV. -

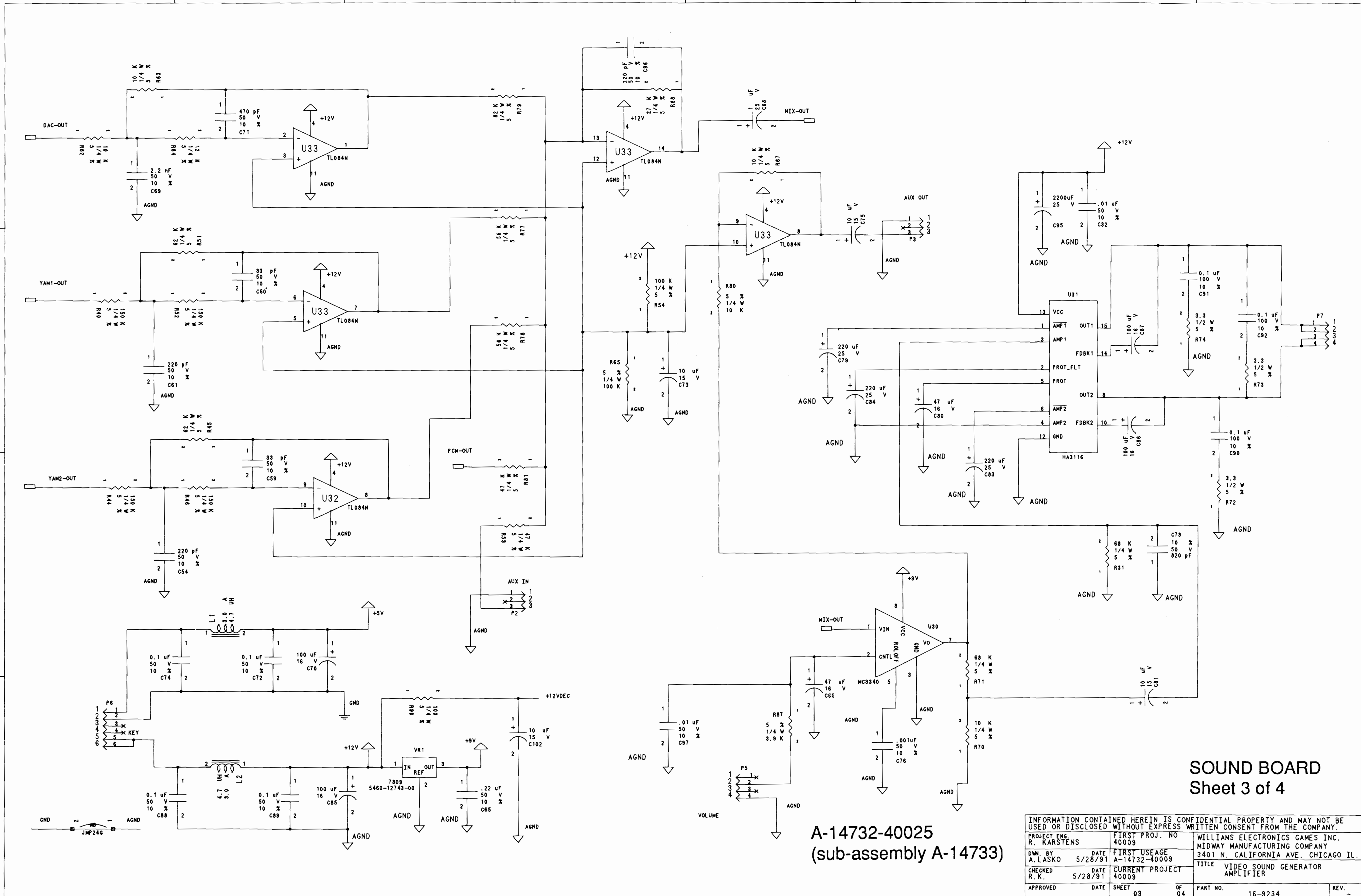


A-14732-40025
(sub-assembly A-14733)

SOUND BOARD
Sheet 2 of 4

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PROJECT ENG. R. KARSTENS	FIRST PROJ. NO 40009	WILLIAMS ELECTRONICS GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
DWN. BY A. LASKO DATE 5/28/91	FIRST USEAGE A-14732-40009	
CHECKED R.K. DATE 5/28/91	CURRENT PROJECT 40009	TITLE VIDEO SOUND GENERATOR MUSIC SYNTHESIS
APPROVED DATE	SHEET 02 OF 04	PART NO. 16-9234 REV. –

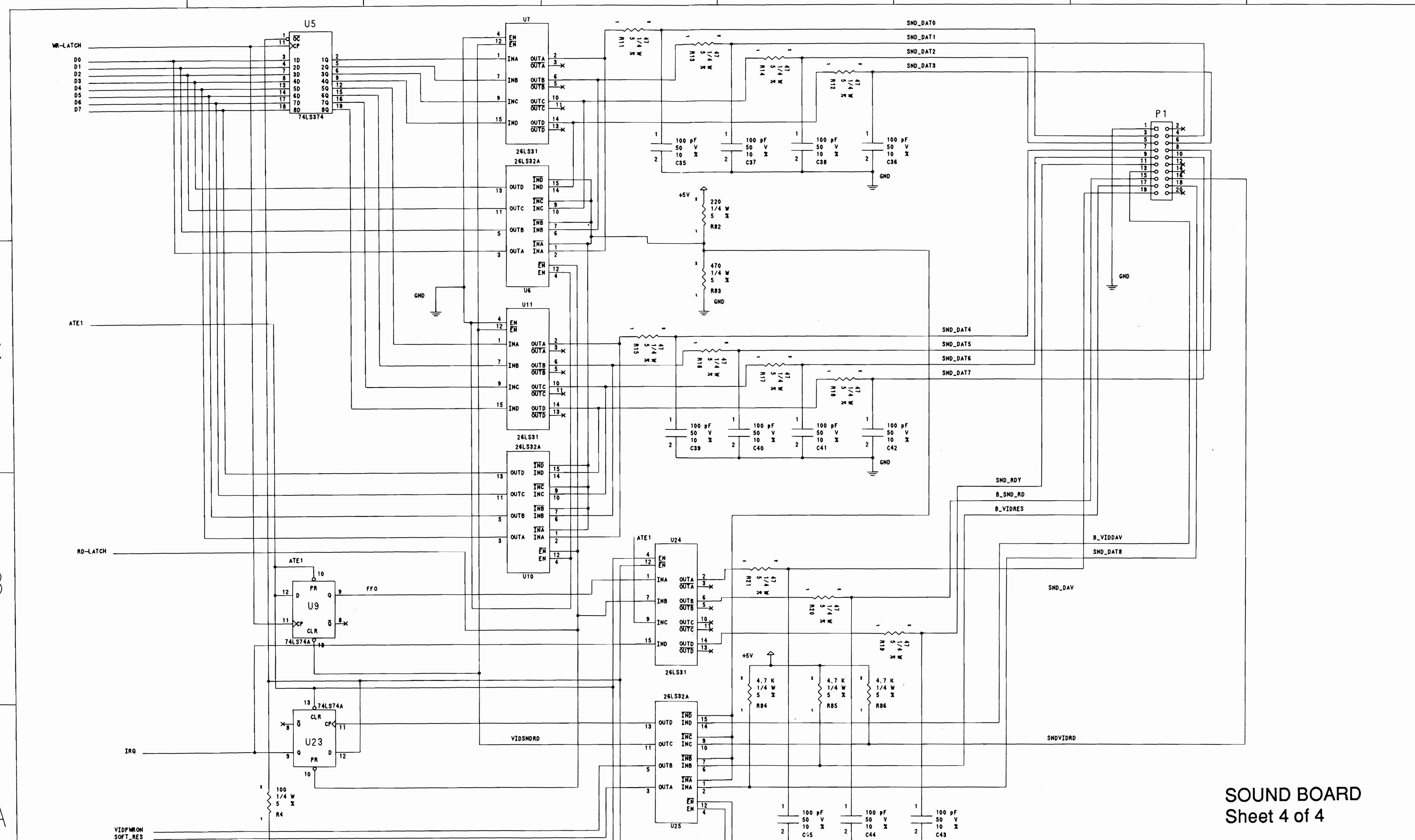


SOUND BOARD
Sheet 3 of 4

A-14732-40025
(sub-assembly A-14733)

INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.

PROJECT ENG. R. KARSTENS	FIRST PROJ. NO 40009	WILLIAMS ELECTRONICS GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
DWN. BY A.LASKO DATE 5/28/91	FIRST USEAGE A-14732-40009	
CHECKED R.K. DATE 5/28/91	CURRENT PROJECT 40009	TITLE VIDEO SOUND GENERATOR AMPLIFIER
APPROVED DATE	SHEET 03 OF 04	PART NO. 16-9234 REV. -



SOUND BOARD
Sheet 4 of 4

A-14732-40025
(sub-assembly A-14733)

REV	DESCRIPTION	ECO
	VPR 7-22-91	27319

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PROJECT ENG. R.KARSTENS	FIRST PROJ. NO 40009	WILLIAMS ELECTRONICS GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
DWN. BY A.LASKO DATE 5/28/91	FIRST USEAGE A-14732-40009	
CHECKED R.K. DATE 5/28/91	CURRENT PROJECT 40009	TITLE VIDEO SOUND GENERATOR INTERFACE
APPROVED DATE	SHEET 04 OF 04	PART NO. 16-9234 REV. –

Control Panel Wire Colors

Player One

Start	Yellow-Green
Up (Jump)	Orange-Black
Down (Duck)	Orange-Brown
Left (Move)	Orange-Red
Right (Move)	Orange
High Punch	Orange-Yellow
Block	Orange-Green
High Kick	Orange-Blue
Low Punch	Red-Black
Low Kick	Red-Brown
Ground	Black

Player Two

Start	Yellow-Blue
Up (Jump)	Yellow-Black
Down (Duck)	Yellow-Brown
Left (Move)	Yellow-Red
Right (Move)	Yellow-Orange
High Punch	Yellow-Violet
Block	Yellow-Gray
High Kick	Violet-Black
Low Punch	Red
Low Kick	Red-Orange
Ground	Black

PC Board Jumpers

CPU Board

Designator	Value
J18, J19, J22, J24, J28	0Ω (Jumper)
R154	0Ω (jumper)
J100, J101	47Ω
R156	68Ω
R165	39Ω

Sound Board (either sub-assembly)

W2, W3, W5, W7, W8

WARNINGS & NOTICES

Warning
USE OF NON-MIDWAY PARTS OR CIRCUIT MODIFICATIONS MAY CAUSE SERIOUS INJURY OR EQUIPMENT DAMAGE! USE ONLY MIDWAY AUTHORIZED PARTS.
* For safety and reliability, substitute parts and modifications are not recommended.
* Substitute parts or modifications may void FCC type acceptance.
* This game is protected by federal copyright, trademark and patent laws. Unauthorized modifications may be illegal under Federal law. This also applies to MIDWAY logos, designs, publications and assemblies. Moreover, facsimiles of MIDWAY equipment (or any feature thereof) may be illegal under federal law, regardless of whether or not such facsimiles are manufactured with MIDWAY components.

Warning
Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generated, uses and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Warning
Prevent shock hazard and assure proper game operation. Only plug this game into a properly grounded outlet. Do not use a cheater plug to defeat the power cord's grounding pin. Do not cut off the ground pin.

Notice
When MIDWAY ships a game, it is in compliance with FCC regulations. Your sticker is proof. If the sticker is missing or damaged, legal repercussions to the owner or distributor of the game may result. If your game does not contain an FCC sticker, call MIDWAY immediately.

Notice

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CALL YOUR AUTHORIZED MIDWAY DISTRIBUTOR.

MIDWAY Manufacturing Company
3401 N. CALIFORNIA AVE.
CHICAGO, IL 60618